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MASSACHUSETTS TUBERCULOSIS LEAGUE

THE PREVENTION AND CONTROL OF TUBERCULOSIS IN THE COMMONWEALTH OF MASSACHUSETTS WITH SPECIAL REFERENCE TO INSTITUTIONAL CARE AND EARLY DIAGNOSIS*

BY FREDERICK T. LORD, M.D.†

IN opening the meeting in celebration of the twentieth anniversary of the establishment of the activities of the League, let me express our appreciation of the cordial invitation to come to Springfield. There have been no changes in the personnel of the League Staff and it is a pleasure to report that the work has gone on in a satisfactory and efficient manner.

I should like to call your attention to certain aspects of the tuberculosis problem in the State and first to the encouraging decline in mortality from tuberculosis.

DECLINING MORTALITY

The pulmonary form of the disease is of chief importance and the mortality has declined during the past 75 years from 395 to 53.9 deaths per 100,000 living. This remarkable diminution is in part to be attributed to improvement in the standards of living. Persistence of the present economic depression is likely to create less favorable conditions and increase the danger from tuberculosis. Standards of living should, therefore, so far as possible, be maintained in spite of the cost. A gradually diminishing amount of community infection is also in part responsible for the declining mortality.

Among the various measures for the prevention and control of the disease, institutional care and early diagnosis are of major importance.

INSTITUTIONAL CARE

Through the generous provision of facilities in institutions there are now over 1.8 beds for each annual death from tuberculosis in State, County and other hospitals in the Commonwealth. By this means the opportunity is afforded for the segregation of patients and the consequent protection of others. Opportunity is thus also provided for an arrest of the disease by rest, the improvement of nutrition and in selected cases the application of collapse therapy by artificial pneumothorax, phrenic nerve operations and thoracoplasty. With the increased provision of institutional facilities, the needs of the community are more nearly met than has hitherto been the case.

LATE RATHER THAN EARLY RECOGNITION OF TUBERCULOSIS

Institutional care is made use of for the most part for patients in the more advanced stages of the disease. Thus Bigelow and Pope (*New Eng. J. Med.* 208: 251 [Feb. 2] 1933) find that over 80 per cent of all patients occupying sanatorium beds are classified on admission as moderately or far advanced. The percentage of moderately and far advanced cases admitted to the Essex County Sanatorium by years from 1922 to 1932, inclusive, is shown on the accompanying graph (fig. 1). I am indebted to Dr. Olin S. Pettingill for the figures on which the graph is based.

Late rather than early diagnosis is not confined to patients admitted to institutions. Pope's figures for the years 1924-29 from death certificates indicate that one-quarter of all reported cases of tuberculosis die within six months and that three-quarters of all recorded deaths from tuberculosis occur within six months of report. As tuberculosis is a protracted disease such a short interval elapsing between the report and the occurrence of death in a large proportion of cases indicates in large measure a failure to discover the disease in its early stages.

Early recognition of tuberculosis is of supreme importance to the affected individual in increasing the chance of an arrest of the disease and of moment to the community in diminishing the spread of infection and the economic loss entailed by the illness.

CASE REPORTING IN MASSACHUSETTS

Tuberculosis has been reportable in the Commonwealth since August, 1907. As shown on the graph (fig. 2) there has been on the whole a slow increase in the ratio of reported cases of pulmonary tuberculosis to deaths from 1.3 in

*Presidential Address at the Annual Meeting of the Massachusetts Tuberculosis League at Springfield, April 24, 1933.

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1908 to 2.0 in 1932. I am indebted to Dr. Alton S. Pope for the figures on which the graph is based. As the appraisal form of the American Public Health Association (W. F. Walker Appraisal Forms for Tuberculosis Associations. *Nat. Tub. Assn.* 28:259, 1932) sets a ratio of two new cases reported annually for each annual death, the returns here have reached the standard set by this organization. This standard, however, represents only the median accomplishment of the better half of communities and is far from indicating the actual amount of tuberculosis in the community.

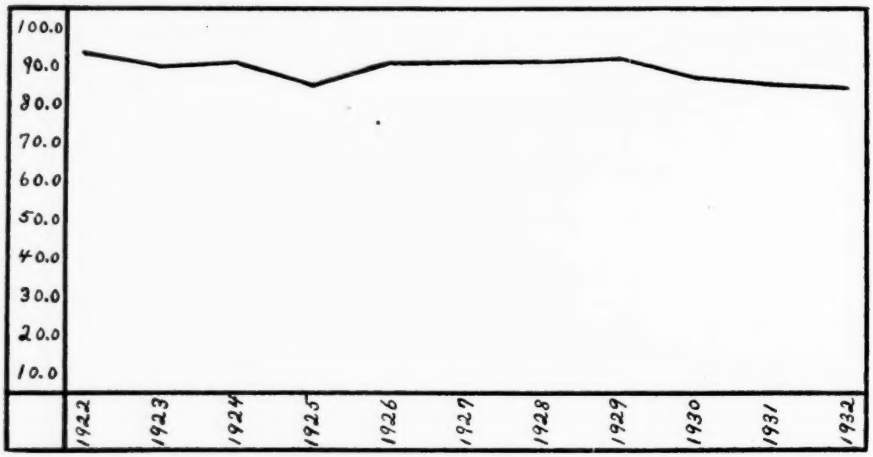

FIG. 1. The proportion of combined moderately and far advanced cases to total number of admissions of pulmonary tuberculosis annually to the Essex County Sanatorium from 1922 to 1932, inclusive.

FIG. 2. Annual ratio of reported cases of pulmonary tuberculosis to deaths in Massachusetts from 1908 to 1932, inclusive.

DATA ON WHICH AN EARLY DIAGNOSIS MAY BE MADE

The adult type of tuberculosis is a secondary invasion and by the time this has occurred, the disease is no longer in its earliest stages. Every effort should be made to discover the primary types and the sources of infection.

In the childhood type of tuberculosis there are usually no symptoms which can be ascribed to the lesions. In the adult type in children there may be a long period during which there are no significant symptoms or physical signs. In both types the disease may be progressive without constitutional disturbance. A positive skin test to tuberculin and roentgen-ray examination of the reactors is essential for recognition of the disease. Of the two types of primary lesions occurring in childhood, parenchymal involvement presents a nodular or diffuse increase of density at any part of the lung. Such lesions cannot with certainty be differentiated from non-tuberculous pneumonia. Non-tuberculous processes, however, usually have a more stormy onset, run a short febrile course with leucocytosis and in favorable cases terminate abruptly after the lapse of seven to ten days, with rapid clearing of the increase of density on roentgen-ray examination. Tuberculous parenchymal involvement subsides only very slowly, usually with the persistence of a linear increase of density or small calcified areas at the site of the process.

Tracheobronchial glandular tuberculosis appears in roentgen-ray films when calcified as larger or smaller, single or multiple, nodular masses of uneven density and irregular margins. Uncalcified glands are visible only when large. Axially-radiated vessels are a principal source of confusion, but may be differentiated by the presence nearby of a bronchus, homogeneous density and round or oval shape with sharply-defined, regular margins. At times exposure from a different angle with disappearance of the shadow due to a vessel may be necessary to make the distinction. Lymphoblastoma may be difficult to differentiate, but may be recognized by the absence of calcification, enlargement of glands elsewhere and a palpable spleen. Inflammatory adenitis of non-tuberculous origin occurs in rare instances.

The diagnostic value of positive skin tests with tuberculin diminishes as age advances. Negative intracutaneous tests with increasing doses up to and including 1.0 mg. are important in excluding tuberculosis. A probable diagnosis of the adult type of the disease may be made in patients with positive skin tests with tuberculin from the following evidence: An appropriate evolution and grouping of symptoms, primary pleurisy, hemoptysis out of a clear sky, moist apical or sub-apical râles and the roentgen-ray finding of fine or coarse, mottled increase of density above the anterior portion of the third rib.

There are, of course, limitations to the reliability of such evidence. The usual sequence and grouping of symptoms may be modified. There may be no symptoms over a long period during which the disease is developing. The chance of error is slight in regarding all primary pleurisies as tuberculous. In rare instances, however, malignant disease of the smaller bronchi extends toward the periphery of the lung and symptoms referable to the pleura are the initial manifestations. Primary endothelioma of the pleura may also be a rare cause of confusion. Pulmonary infarction from latent thrombophlebites may cause an apparent primary pleurisy. Regarding hemoptysis, it is a valuable clinical rule subject to few exceptions that hemoptysis out of a clear sky is due to pulmonary tuberculosis. Malignant disease of the bronchus and pulmonary infarction among other conditions may in rare instances cause hemoptysis out of a clear sky. Physical findings are significant only when positive and are then subject to considerable limitation. In adults as well as in children there may be no physical signs and roentgen-ray examination may be positive. Technically satisfactory and at the same time negative roentgen-ray films are almost certain evidence against pulmonary tuberculosis, but fine or coarse mottled increase of density above the anterior portion of the first rib is rarely due to other cause than tuberculosis.

The diagnosis may be regarded as established by the finding of tubercle bacilli in the sputum, but negative sputum examinations are common in early cases, may obtain at any period of the disease and do not serve to exclude tuberculosis.

NEED OF INTENSIVE INVESTIGATION OF THE SOURCE OF INFECTION

The most important measure for the finding of the source of infection is investigation of all family contacts by skin tests with tuberculin and clinical and roentgen-ray studies. The discovery of a patient with tuberculosis is only the first step and serves as a point of departure for the investigation of others. By this means 19 per cent of family contacts were found by Remick and Peters (quoted from Bigelow and Pope; *New Eng. J. of Med.* 208: 251 [Feb. 2] 1933) to have either the adult or the childhood type of tuberculosis. Bishop and Stewart (*J. A. M. A.* 99: 356 [July 30] 1932) found tuberculosis in 20 to 25 per cent and Rathbun [*Nat. Tub. Assn.* 25: 278, 1929] certain or probable tuberculosis in 31 per cent of family contacts.

FACILITIES FOR INVESTIGATION OF FAMILY CONTACTS IN MASSACHUSETTS

Readily accessible roentgen-ray facilities are available throughout the Commonwealth on request by physicians. Such services are furnished by the State and County sanatoria, by extension of their facilities to include neighboring localities not otherwise covered and by many municipalities. It is important that workers in different regions of the State inform themselves of the opportunities in their respective fields.

RESPONSIBILITIES OF THE MASSACHUSETTS TUBERCULOSIS LEAGUE

The League and its affiliated organizations play an important part in formulating a public opinion favorable to the carrying out of measures for the prevention and control of tuberculosis and should assist in every possible way in the prosecution of such measures. It should be more generally appreciated that early discovery of tuberculosis is a matter of chief importance and of moment not only to the affected individual in promoting arrest of the disease, but also to the community in preventing spread of infection and diminishing economic loss. Our efforts should be especially directed toward securing a larger proportion of consents from parents for the investigation of school children by skin tests with tuberculin and roentgen-ray examination of the reactors, and in making known the desirability of the investigation of family contacts of all tuberculous patients. With the completion of the Ten-Year Program, responsibility for continuance of the investiga-

tion of school children will fall upon local communities and your coöperation and assistance will be helpful in the success of the project. Roentgen-ray facilities are now available throughout the State and should be familiar to workers in different localities.

THE TREATMENT OF COMMINUTED COLLES' FRACTURE IN ELDERLY PATIENTS*

BY G. E. HAGGART, M.D.†

IN elderly patients, fracture of the lower end of the radius is often seen. In the last twenty-five such fractures treated in the Clinic 17, or 68 per cent, occurred in patients over fifty-eight years of age. Comminution of the fragments was frequently present, presumably because of the more brittle avascular bone involved.

In all of these cases, fracture followed a heavy fall on the outstretched hand. Disability was immediate and complete. All cases presented swelling but particularly was this true in obese patients seen four hours or more following injury. The statement that all fractures are an emergency is especially applicable to these cases because early prompt reduction not only prevents swelling and lessens shock by removing pain, but particularly does reduction and proper splintage permit early *active* motion of the adjacent finger joints. This point cannot be too strongly emphasized. Stiff, non-functioning finger joints are seen all too frequently following fractures of the radius in elderly patients. Regardless of the degree of arthritic change already present in the interphalangeal joints, a fracture of the radius need not and should not be a factor in further progression of this very disabling arthritis. Prevention of such increasing finger joint deformity lies in early reduction of the radial fracture followed by proper splintage which in turn permits active essentially normal finger joint function.

Anaesthesia: A comminuted distal radial fracture is best reduced under general anaesthesia. In our hands local anaesthesia for this fracture has not been satisfactory. Novocain block of nerve trunks at elbow or axilla can be considered if general narcosis is contraindicated. I believe the anaesthetic of choice to be avertin (tribromethylalcohol). These elderly patients receive on an average of 70 milligrams per kilogram of body weight. Reinforcement with nitrous oxide or ethylene is usually not necessary. This is a significant point as the reduction is performed in the dark fluoroscopy room where absence of anaesthesia apparatus is appreciated.

Reduction: The object in reducing a comminuted Colles' fracture is particularly directed toward overcoming the dorsal tilt of the articular surface of the radius, and thus restoring a normal radiocarpal joint relationship. Obviously indicated is the breaking up of impaction and then realignment of the radial fragments in the usual contour of the bone. Manipulation and reduction are best performed under the fluoroscope.

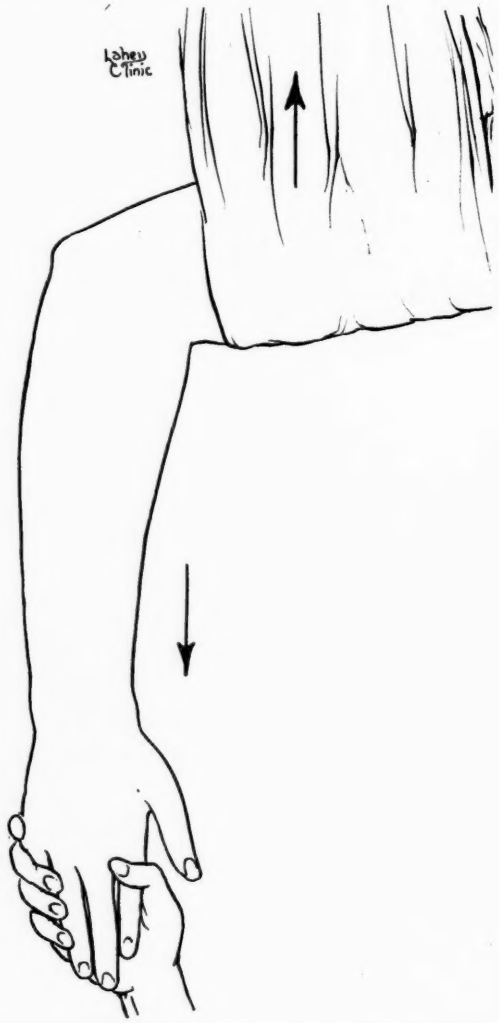

FIG. 1. Traction and countertraction as employed in reduction of Colles' fracture. The band about arm is tied to a fixed point on the fluoroscopic table.

Figure 1 illustrates the application of traction and countertraction as employed in reduction of this fracture. The strap or band about the mid-arm furnishes a fixed point against which the operator can maintain steady traction and yet have complete control of the hand, wrist and forearm.

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With the anaesthetized patient lying on the fluoroscopic table, and traction instituted as described, any impaction of the radial fragments is first broken up. With traction maintained, the fragments are then moulded into alignment by firm pressure of the thumb of the operator's hand, passing distally over the dorsum of the patient's wrist, while the latter is grasped by the operator as illustrated. (Fig. 2.) This

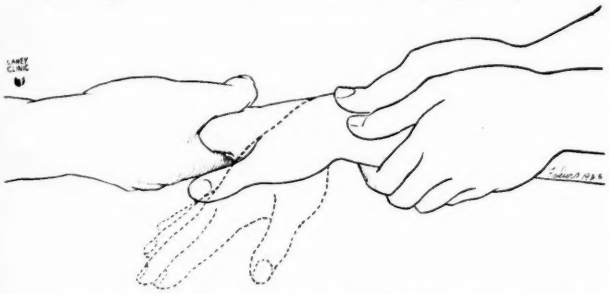

FIG. 2. Moulding radial fragments into position. Flexion of hand to lock fragments, as indicated.

maneuver brings the patient's hand into sharp volar flexion, thus fixing the reduced radial fragments in position. If necessary, the fragments are additionally aligned by slight ulnar deviation of the hand.

Under the fluoroscope, the position of the fragments is again visualized, and the relationship of the radiocarpal joint observed. Thereafter, a decision is reached on the position of the hand which best maintains alignment and the normal joint anatomy. This position is then held by the operator and an assistant now applies the so-called "sugar tong" plaster splint.

FIG. 3. "Sugar tong" plaster splint.

Splint: The "sugar tong" plaster splint (fig. 3), originally devised by Simpson, is one of the most efficient and at the same time simplest appliances that can be employed in fractures of the forearm. The splint consists of a plaster of Paris bandage reverse (fig. 3A), covered on one side by Canton flannel (fig. 3B). The length of the splint is determined by the distance from the knuckles up the dorsal forearm around the elbow and down the volar surface of the forearm to the base of the fingers. Trimmed at the wrist so that the plaster edges will not overlap, and cut out over the thenar eminence, the splint after having been well rubbed but while still moist, is applied to the elbow, forearm, wrist and hand, and bandaged snugly in place with gauze bandage. (Fig. 4.)

It is important to note that the ends of the splint terminate at the knuckles on the dorsum and just proximal to the base of the fingers on the volar surface of the extremity. When properly applied the splint permits the patient

FIG. 3A. Plaster of Paris bandage reverse from which splint is made. Length of splint determined by individual patient's forearm and hand.

complete flexion in all the interphalangeal and metacarpophalangeal joints. In addition to an-

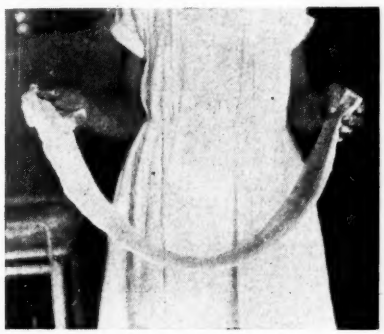

FIG. 3B. Completed splint before application; Canton flannel applied to one side of moist plaster reverse.

terior-posterior immobilization of the radius and ulna, by passing around the elbow, the splint

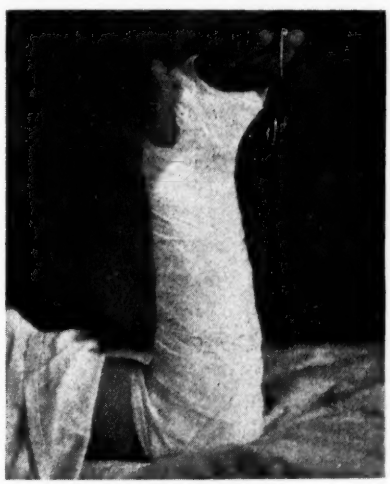

FIG. 4. "Sugar tong" plaster splint applied. Normal interphalangeal and metacarpophalangeal joint motion is allowed.

also prevents pronation and supination, an especially important stabilization when the frac-

ture is comminuted. Motion of the elbow is not completely limited as the appliance permits an average total range of 30 to 40 degrees flexion—extension of the elbow joint.

Following reduction if further swelling occurs accompanied by pain and edema of the fingers, the gauze bandage is cut between the two arms of the splint, and a fresh bandage put on without disturbing the previous one. Contrariwise, as the initial swelling subsides another bandage is snugly applied. In this way no disturbance results in the alignment of the bone fragments.

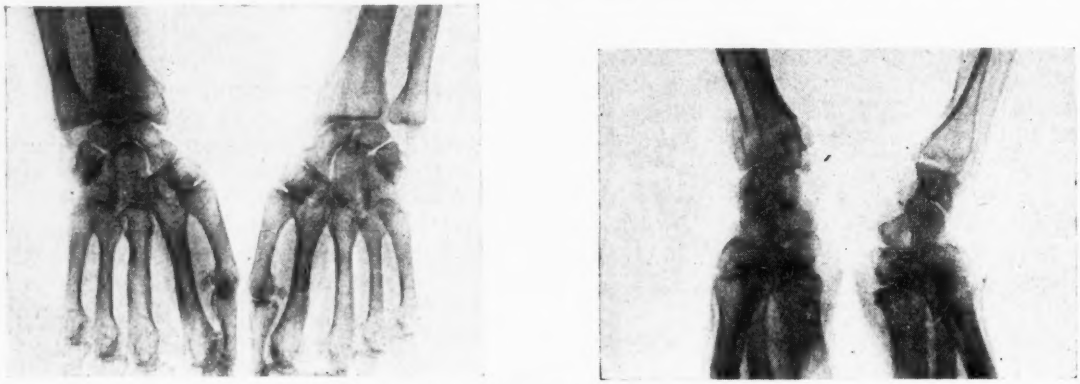

FIG. 5. X-ray of both wrists, showing right Colles' fracture, E. W. T. Aged 70—at reduction radial fragments were found to be extensively comminuted. Note dorsal tilt of radial articular surface.

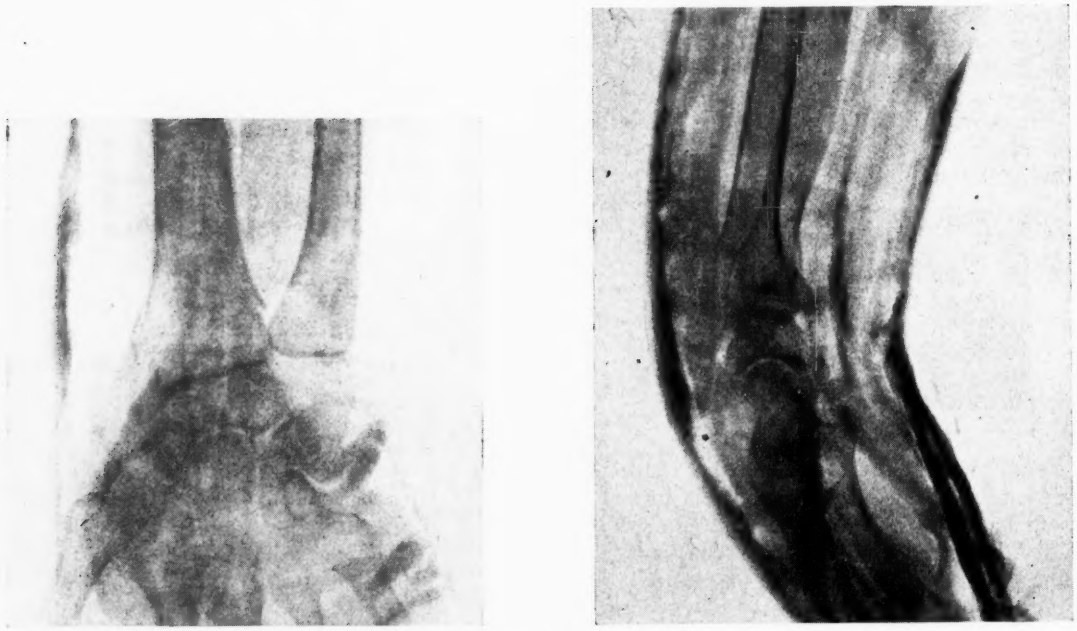

FIG. 6. X-ray after reduction and application of "sugar tong" splint. Restoration of contour of radius and correction of dorsal tilt.

Postoperative Course: After x-ray plates are taken to confirm the satisfactory position of the fragments, emphasis is placed upon two important instructions given the patient. They are first, to constantly use the fingers, not only actively moving the joints through their maximum range, but at all times to employ the fingers as in normal daily use. Secondly, to abduct the entire arm over the head a minimum of six times a day. By this simple maneuver, the patient prevents loss of shoulder joint function which is so prone to occur if the arm is constantly held at the side of the body. Particularly is this true since falls on the outstretched hand frequently cause trauma to the tendon of the supraspinatus muscle and to the subacromial bursa, with consequent loss of shoulder joint motion.

When should the splint be removed? It is the author's experience that in the type of case under discussion best results are secured by maintaining the original position and splint a minimum of five to seven weeks. This is directly contrary to our practice in uncomplicated Colles' fractures in younger adults, where the

bandage is cut down in seven to ten days, the dorsal "tong" sprung open and early massage instituted. In young people, active motion can frequently be allowed in the second week, and all splintage removed in the third week.

In the elderly patients with comminuted Colles' type of fractures, because of delayed bone repair, even relatively early mobilization frequently results in a complete or partial recurrence of the original deformity, as the distal radial shaft crushes down under the leverage exerted by the dorsiflexed hand against the lower end of the radius. It is therefore necessary, in these patients, to protect the slowly forming callus. One of the two cases reported below illustrates this point.

On removal of the splint and with satisfactory checkup x-rays, active physiotherapy is instituted. This comprises heat in the form of radiant light (whirlpool baths are often most helpful), massage, and *active* exercises. Passive exercises are never permitted. As a rule additional dorsal or volar splints are not necessary.

CASE REPORT: Miss E. W. T., aged 70, was admitted to the Clinic three hours after a severe fall on the outstretched hand with resulting complete disability of the affected extremity. Figure 5 is the admission x-ray. The extensive comminution later found at manipulation is not evident in these films. Reduction was carried out as described with the result shown in figure 6. Note the anatomical relationship of the radiocarpal joint and the normal alignment of the radial fragments. Figure 4 shows the splint applied in which the patient had normal interphalangeal and metacarpophalangeal joint motion.

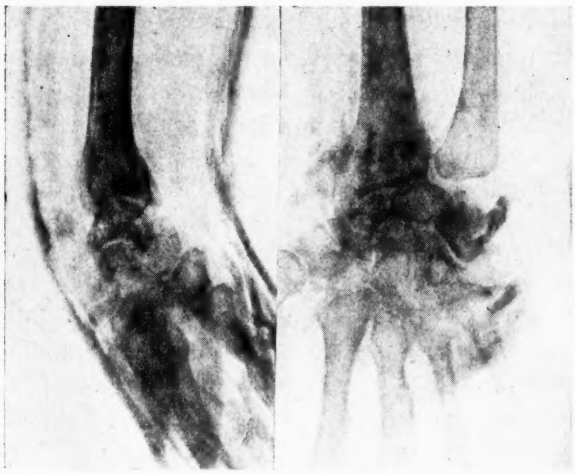

FIG. 7. Five weeks after reduction; maintenance of position; early callus formation. Clinically healed fracture—see text.

At the end of five weeks the checkup x-ray (fig. 7) revealed maintenance of reduction and new bone proliferation. On removal of the splint there was no local tenderness and the fracture appeared to be sufficiently healed to warrant active use of the wrist. Early motion of the wrist was particularly indicated in this patient because of a previous injury to the hand, which the patient stated was a fracture treated elsewhere one year before admission. As a result there was considerable stiffness in the use of the wrist joint and midfinger.

After removal of splint the patient progressively increased her range of wrist motion without symptoms and in the eighth week after operation declared she had a normal hand and wrist joint. On examination, there was volar flexion of the hand to right angle; dorsiflexion of 60 degrees; normal radial and ulnar flexion as compared with the non-injured side; forearm pronation normal, supination to within

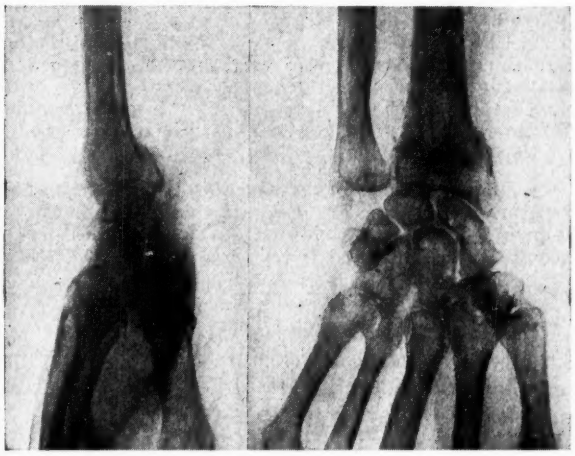

FIG. 8. Eight weeks after reduction. Partial recurrence of deformity. Fortunately no dorsal tilt of radial articular surface.

FIG. 9. Case II. X-rays of a severely comminuted fracture dislocation of lower radius and ulna in man of 68. Splinted 7 weeks.

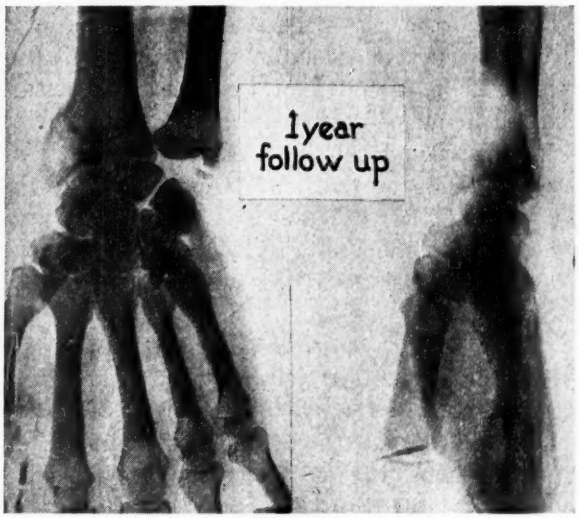

FIG. 10. Case II. End result.

ten degrees of normal. The finger joint motion was normal except for some limitation in midfinger due to the previous injury. However, an x-ray (fig. 8) at this time reveals a partial recurrence of the original deformity though fortunately no tilt of the radial articular surface.

Comment. While it is true that clinically the patient has good function and that she is pleased with the result, nevertheless as stated in the text and as shown by the x-ray (fig. 8) the splint should have been left on longer in a patient of this age.

CASE II

In contrast, figure 9 shows a severely comminuted fracture dislocation of lower radius and ulna in a man of 68. He was splinted seven weeks with the result shown in figure 10.

SUMMARY

1. Comminuted Colles' fractures are of relatively frequent occurrence in elderly patients. The comminution appears to be due to the presence of brittle avascular bone.

2. Prompt reduction of the fracture is imperative.

3. Reduction is best carried out under general anaesthesia, avertin preferred, and performed under the fluoroscope.

4. It is most important that the dorsal tilt of the radial articular surface be corrected, so that normal radiocarpal joint relationship is obtained.

5. The pronounced advantages of the "sugar tong" plaster splint are described.

6. Because of the tendency to recurrence of the deformity of the distal end of the radius in these patients due to delayed bone repair, it is believed that the extremity should be continuously immobilized in the "sugar tong" splint a minimum of six weeks. The splint is adjusted as indicated; unless there originally was marked swelling, this adjustment does not require removal of the splint.

7. The necessity of free finger joint motion is emphasized, a range of motion made possible by careful application of the splint, and the advantage is stressed of daily complete arm abduction to avoid shoulder joint complications.

8. With intensive massage and active motion following the above plan of management, a good result can be anticipated.

SECOND PRIMARY CANCER IN CASES OF CANCER OF THE BUCCAL MUCOSA*

A Mathematical Study of Susceptibility to Cancer

BY CHARLES C. LUND, M.D.†

WARREN and Gates[1] have recently proved from a study of autopsy material that two independent cancers are found about four times as frequently as can be accounted for by chance. From this they conclude that patients with cancer have a definite tendency to this disease. They do not, however, from the mathematical point of view, separate this tendency to cancer into any subdivision in relation to particular kinds or location. On account of the limited number of cases and diversified types of cancer in their autopsy series it would have been impossible to do this with any degree of accuracy.

The present study concerns the same problem from the clinical point of view and is based on data derived from 1548 cases of cancer of the buccal mucosa seen at the Collis P. Huntington Memorial Hospital of Harvard University during the years 1918-1926. Studies of the results of treatment, of the pathology, and of syphilis among these cases have been published in a series of papers.[2, 3, 4, 5, 6].

Buccal cancer is of special importance for such a study because of many unique or nearly unique aspects of the disease.

First, it is a form of cancer that arises, except rarely, only after long-continued chronic irritation. This irritation comes usually from tobacco, oral sepsis, mechanical irritation or betel nut chewing. In addition to these etiological factors leading to cancer in any part of the mouth, syphilis is also an etiological factor in cancer of the tongue[5]. In Europe and America sex might be thought also to be of direct etiological importance since about 90 per cent of the cases are males, but the equal sex incidence of betel nut cancer in the East, where both sexes apparently are equally exposed to this habit, eliminates this possibility. Infinitely more people are subject to severe irritation from these factors than ever develop cancer. For this reason there must be, in addition to the irritation, a proper background of susceptibility.

Secondly, cancer of the buccal mucosa seldom

*From the Cancer Commission of Harvard University. This work was supported financially by gifts from anonymous donors and a grant from the Delamar Mobile Research Fund of the Harvard Medical School.

Read before the meeting of the Harvard Medical Society, November 28, 1933.

†Lund—Surgeon to the Collis P. Huntington Memorial Hospital. For record and address of author see "This Week's Issue," page 1179.

metastasizes below the clavicle and, conversely, cancers of other organs seldom metastasize to the mouth. Therefore, for example, cancer of the tongue and cancer of the rectum occurring in the same patient can be considered to be of independent origin even without microscopic evidence, if the other evidence in the case is reasonably conclusive.

Thirdly, cancer of the buccal mucosa is easy to examine by direct inspection so that, at least in the late stages of the disease, the clinical diagnosis is reasonably accurate.

Fourthly, this cancer, when not cured by surgery or radiation, usually recurs promptly[4] and obviously. When a new cancer develops years later on the surface of another part of the mouth, such occurrence may be fairly considered to be the development of new disease rather than recurrence.

MATERIAL

The records of the 1548 patients with cancer of the mouth have been studied for evidence of other cancer before, during or after treatment in the clinic. The cases with suspicion of multiple cancer are divided into groups according to the time relationships of the cancers and according to the locations of the second tumor. The division of the cases is seen in table I. The details of each case are listed in tables II to IX at the end of the paper.

TABLE I

MULTIPLE PRIMARY CANCER

Details in Table No.	Group of Cases	
2	History of One Previous Cancer	10
3	History of Multiple Previous Cancers	3
4	Buccal Cancer with One Skin Cancer	14
5	Buccal Cancer with Multiple Skin Cancers	5
6	Two Buccal Cancers	25
7	One Buccal and One Other Cancer	31
8	Two Buccal and One Other Cancer	2
9	Three or More Buccal Cancers	4
	Total	94

Inasmuch as the data are incomplete in most of the cases whose only additional cancer was removed before coming to the clinic, these cases, listed in tables II and III, are not considered further in this study.

ASSOCIATION OF BUCCAL CANCER WITH SKIN CANCER

Because skin cancer is, in proportion to its frequency of occurrence, so infrequently a cause of death, there is no way to calculate even roughly how often this disease occurs in the population. For this reason these cases also, although listed in tables IV and V, are not used statistically as are the cases in later tables. Warren and Gates included such cases in their calculations. For this reason these cases are tabulated so that comparison with their tables may be made.

CALCULATION OF CHANCE OF MULTIPLE CANCERS

Tables VI, VII, VIII and IX list all other cases of multiple cancer in the series. In each table they are arranged in order of definiteness of diagnosis and in order of the length of time between the appearance of the first and the second cancer.

The sixty-two cases listed in these tables do not necessarily prove that cancer is more frequently associated with cancer than can result from chance alone. To show this the chance of occurrence of a single cancer in any patient in the group must be calculated.

The basis of the calculations used is as follows: Every case was considered to have the same risk of dying from any cause or any particular cause or causes according to his age and the length of time he lived as a normal member of the population would have. This was considered to be true even if he was dying from his first cancer.

Tables were prepared by the Department of Vital Statistics of the Harvard School of Public Health that show the chance of dying (table X), the chance of dying of any kind of cancer (table XI) and the chance of dying of buccal cancer (table XII). These were all made on the basis of Massachusetts death rates for males during the years 1920-1930. They were prepared according to the special age groupings and length of observations indicated on the record cards used in this study.

COMPUTED AND ACTUAL DEATHS FROM INTERCURRENT DISEASES

Using table X, a fraction representing the chance of dying for each of the 1548 patients

under consideration was determined. The sum of these fractions was 137.3. This represents the calculated number of deaths from any kind of intercurrent disease that should have occurred in this group. Actually the end result data showed 136 deaths. The close approximation of the calculated to the actual figures is mostly due to luck, as the distribution of the different immediate causes of death, so far as they have been studied, is very abnormal.

Of the theoretical 137 deaths, calculations of the same kind based on data given in table XI result in a figure of 18.7 as the expected number of deaths from a second cancer. Actually there were 50 deaths from a second cancer and only 86 from non-malignant causes instead of the calculated 118.6. The low number of deaths from non-malignant causes is believed to be due to the reporting of deaths as due to cancer, when as a matter of fact the cancer, though present, did not cause death; and also to the fact that, in classifying the cases in the end result study, when there was any doubt the case was considered to have died from the original cancer. This was done to avoid any chance of making the statistics appear better than the results actually justified.

DEATHS FROM INTERCURRENT CANCER

If a purposeful error of judgment accounts for the low number of deaths reported as due to non-malignant causes, do other systematic errors account for the three-fold increase of deaths from a second malignancy over the expected number? It is firmly believed that this is not true. In any case of doubt as to the cause of death, the original cancer was considered to be the cause rather than a second cancer or a non-malignant cause. For this reason there may well have been actually many more second cancers than are here reported.

The next point of importance is the location of the second cancer. As will be seen from tables VI and IX, second cancers are nearly evenly divided between those occurring in the buccal mucosa and those occurring elsewhere. However, the deaths were somewhat more numerous among the miscellaneous cases. On the basis of calculation from table XII the number of deaths from intercurrent buccal cancer should have been 1.4. After the calculations for this paper were completed, evidence has been determined[7] that leads to the belief that mortality tables for buccal cavity cancer fail to include about 30 per cent of the cases that actually occur. It is impossible at present to correct for this in table XII except by a flat increase of each figure, as the data mentioned are not of sufficient magnitude to be studied by age groups. A correction of this amount applied to the calculated intercurrent buccal deaths would raise this number to 2.1. Subtracting this number from 18.7, the total expected cancer deaths, leaves 16.6 cancer deaths to be expected from tumors of other regions. Actually from tables VII and IX there were 33 such cases with 32 deaths. This is roughly twice the computed number.

DEATHS FROM INTERCURRENT BUCCAL CANCER

From tables VI and IX (neglecting the two cases from table VIII already counted) there were 29 cases of intercurrent buccal cancer with 21 deaths. In comparison to the computed figure of 2.1 this shows that there were ten times as many deaths from second buccal cancer as there should have been. Because such a large proportion of the second buccal tumors were cured, this figure of 10 times does not express the relationship correctly. Even on the extremely strict basis of pathological proof of each of two tumors there were 16 instances or eight times the expected number.

DISCUSSION

The mucous membrane of the mouth may be universally injured to some extent by most of the forms of irritation that lead to cancer at any one point. Even when no premalignant lesion, such as leukoplakia, is visible, the whole area of the buccal mucosa must be considered to be in a premalignant condition. This seems to be amply demonstrated by the cases and calculations given above. The same conditions are found with respect to cancer of the skin, which so frequently occurs in multiple foci. Even in other locations there is probably a much greater tendency to the development of a second cancer in the same or similar type of tissue than in the body as a whole. This may be seen in table XVIII in Warren and Gates' paper, where six of the cases show two carcinomas in the same type of tissue. In their study it would not be reasonable to expect such a high pro-

portion of multiple carcinomas of the same organ as in the present study, for at autopsy many multiple tumors would have so greatly encroached on each other that the resultant mass would not be recognized as having originated from two or more foci. In the tables in their paper that concern cases collected from the literature it is seen that with respect to carcinoma about 315 instances occurred in the same type of tissue, 76 in the same system, but not the same tissue, and only 262 in totally different systems and tissues.

Roughly recalculating the data in Warren and Gates' table XIX, leaving out the cases of skin carcinoma and carcinoma of the same organ or system, it is seen that the actual occurrence of multiple cancers of different systems is 2.5 times the expected, which is a figure not greatly different from that arrived at by the totally different approach to the subject that was followed in the present study.

In the light of these data the tendency to multiple cancers must be considered in two parts. First the tendency to cancer in general, leaving out the cases of local re-occurrence. This, as shown above, occurs about twice as frequently as it is to be expected. This increased frequency must be due to whatever general factors there are, for instance, heredity, that promote the proper background for the development of cancer. Secondly comes the tendency to local re-occurrence which has been shown to be at least fifteen times as common as chance should produce. In this case any general factors would also play their part. It is possible that, with respect to cancer of the mouth, the difference between two and fifteen is the difference between the importance of the general and the local factors in the cause of cancer.

In spite of all the brilliant work done by surgeons and radiologists in improving the treatment of cancer in the last generation, and in spite of the large numbers of "cured" patients that may be demonstrated anywhere at any time, there is still a widespread feeling among the lay public that once a patient has cancer he always has it. The data in this paper show a reason why this feeling should exist in spite of the increasing numbers and percentage of cases "cured" of individual cancers. A layman cannot be expected to distinguish between recurrence and re-occurrence or between cervical metastasis following cancer of the tongue and, for instance, primary cancer of the thyroid following it. In a disease, such as cancer of the mouth, where only 10 per cent of the cases coming to the average clinic are cured, if nearly half of these "cures" die of another cancer, the layman is more nearly correct in his estimate of the situation than the surgeon who stresses not the small per cent of cures in the whole series but the much larger per cent of cures that he obtains in the patients that he treats, which are the most favorable cases.

On the other hand, it is important to distinguish between recurrence and re-occurrence as may be seen from a study of the cases in tables VI and IX. Of the 22 patients in these tables whose first cancer was cured, seven have been followed 10, 10, 7, 4, 4, 1, and one year respectively after treatment of their second cancer without recurrence of either cancer. The other 15 patients died from their second or later cancers. This salvage of about 30 per cent is much better than can be expected in the treatment of true recurrence and indicates that energetic treatment of reoccurrence is very much worth while.

SUMMARY AND CONCLUSIONS

1. Statistical evidence from a series of cases of buccal carcinoma indicates that development of a second carcinoma of the mouth is about 15 times as common as it should be if chance alone were the only factor in such development.

2. Similar evidence from the same cases shows that development of cancer of some other organ is about twice as common as it is in the population of like age and sex.

3. It is suggested that the ratio between the increased tendency to new cancer in general, when compared with the much greater increased tendency to new local cancer may indicate the relative importance between general factors, such as heredity, and local factors, such as irritation, in the cause of buccal cancer.

4. The frequent occurrence of second cancers must be kept in mind because with proper treatment the prognosis of the second is as good as of the first and much better than that of recurrences.

The author wishes to thank Professor E. B. Wilson, Miss Hilda M. Holton, Miss May Gavin and others for their invaluable assistance in the preparation of this paper.

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TABLE II

CASES OF PROBABLE CANCER TREATED BEFORE ADMISSION

Two Cancers Only

Case No.	Age	Location Present Carc.	Evidence	Time of Previous	Location	Descrip. in History	Evidence in Record
1	53	Tongue	P	4 yrs.	Tongue	Carc.	P
2	65	Tonsil	P	42 yrs.	L. Lip	Carc.	H
3	74	Cheek	C	5 yrs.	Cheek	Growth	H
4	70	U. Jaw	C	7 yrs.	L. Lip	Carc.	H & S
5	53	U. Jaw	C	12 yrs.	L. Lip	Growth	H
6	57	Tongue	C	23 yrs.	L. Lip	Carc.	H
7	55	L. Jaw	C	30 yrs.	L. Lip	Growth	H
8	64	L. Lip	C	4 yrs.	Skin	Carc.	P
9	73	Tongue	C	3 yrs.	Skin	Carc.	H
10	73	L. Jaw	C	10 yrs.	Skin	Lesion	H

Symbols: C—Clinical Examination
H—History
L—Lower
P—Pathological Examination
S—Scar Noted
U—Upper

TABLE III

CASES OF PROBABLE CANCER TREATED BEFORE ADMISSION

More Than Two Cancers

Case No.	Age	Location Present Carc.	Evidence	Time of Previous	Location	Descrip. in History	Evidence in Record
11	55	L. Lip	P	2 yrs.	L. Lip	Lesion	H & S
				4 yrs.	L. Lip	Lesion	H & S
12	71	L. Lip	P	1 yr.	Skin	Growth	H
				1 yr.	Skin	Growth	H
13	55	Cheek	C	2 yrs.	Cheek	Growth	H
				6 yrs.	Cheek	Growth	H

TABLE IV

BUCCAL CARCINOMA ASSOCIATED WITH ONE SKIN CARCINOMA

Case No.	Age	Location Buccal	Evidence	Interval	Evidence Skin
14	75	L. Lip	P	None	P
15	72	L. Lip	P	None	C
16	69	L. Lip	P	None	C
17	90	L. Lip	C	None	P
18	70	Floor	C	None	C
19	56	Floor	C	None	C
20	83	Tonsil	C	None	C
21	77	L. Lip	C	None	C
22	51	L. Lip	P	3 mos.	C
23	69	L. Lip	P	1 yr.	C
24	58	Tongue	C	4 mos.	C
25	54	Tongue	C	6 mos.	C
26	61	L. Lip	C	1 yr.	C
27	70	Tongue	C	3 yrs.	C

TABLE V

BUCCAL CARCINOMA ASSOCIATED WITH MULTIPLE SKIN CARCINOMA

Case No.	Age	Location Buccal	Evidence	Interval	Evidence Skin
28	75	L. Lip	P	None	C
				4 yrs.	C
29	69	L. Lip	C	None	C
				7 yrs.	C
				13 yrs.	C
30	71	L. Lip	C	None	C
				1 yr.	C
				2 yrs.	C
				3 yrs.	P
31	71	L. Lip	C	6 mos.	C
				2 yrs.	C
32	79	L. Jaw	P	1 yr.	C
				1 yr.	C

TABLE VI

TWO CANCERS—BOTH IN MOUTH

Case No.	Age	Location	Evidence	Time Interval	Location of 2d	Evidence	Time from 1st to End Result	Cause of Death
33	65	Cheek	P	None	L. Jaw	P	6 mos.	1 & 2
34	66	Tonsil	P	None	Tonsil	P	6 mos.	1 & 2
35	67	Tonsil	P	2 mos.	L. Lip	P	1 yr.	Heart
36	42	Tongue	P	4 mos.	Cheek	P	10 yrs.	L & W
37	57	L. Lip	P	6 mos.	Tongue	P	3 yrs.	2
38[1]	58	L. Lip	P	1 yr.	L. Lip	P	11 yrs.	L & W
39	67	Tongue	P	3 yrs.	Tongue	P	4 yrs.	2
40	65	Floor	P	5 yrs.	Tonsil	P	6 yrs.	2
41	60	Cheek	P	6 yrs.	Cheek	P	8 yrs.	2
42	55	Cheek	P	9 yrs.	Cheek	P	10 yrs.	2
43	40	Cheek	P	11 yrs.	Cheek	P	12 yrs.	L c 2
44	53	Cheek	P	None	Tonsil	C	1 yr.	1 & 2
45	62	Palate	P	None	L. Jaw	C	1 yr.	1 & 2
46	68	L. Jaw	P	None	Palate	C	6 mos.	1 & 2
47	67	Cheek	P	5 yrs.	L. Lip	C	9 yrs.	L & W
48	65	Tongue	P	5 yrs.	Tongue	C	5 yrs.	2
49	70	U. Lip	C	2 yrs.	L. Lip	P	2 yrs.	1 & 2
50	70	Cheek	C	7 yrs.	Cheek	P	7 yrs.	2
51	44	L. Lip	C	8 yrs.	Cheek	P	9 yrs.	L & W
52	65	L. Lip	C	9 yrs.	L. Lip	P	10 yrs.	2
53	66	Cheek	C	None	Palate	C	1 yr.	1 & 2
54	70	Cheek	C	None	Cheek	C	7 yrs.	L & W
55	86	L. Lip	C	1 yr.	U. Lip	C	3 yrs.	2
56	68	L. Jaw	C	1 yr.	L. Lip	C	5 yrs.	L & W
57[2]	67	Cheek	C	7 yrs.	Cheek	C	9 yrs.	2

[1] This case also had history of cancer of lip 6 yrs. before 1st of these.
[2] This case also had history of cancer of cheek 10 yrs. before 1st of these.

TABLE VII

TWO CANCERS—ONE IN MOUTH

Case No.	Age	Location of 1st	Evidence	Time Interval	Location of 2d	Evidence	Time from R of 1st to End Result	Cause of Death
58	68	L. Lip	P	2 yrs.	Uterus	P	5 yrs.	1 & 2
59	47	Tongue	P	2 yrs.	Pharynx	P	3 yrs.	2
60	60	Tongue	P	3 yrs.	Oesophagus	P	4 yrs.	2
61	58	L. Lip	P	4 yrs.	Sigmoid	P	10 yrs.	L & W
62	40	Tonsil	P	None	Rectum	C	1½ yrs.	1 & 2
63	49	Tonsil	P	None	Abdomen	C	2 mos.	1 & 2
64	55	Tongue	P	2 mos.	Pelvis	C	2 mos.	1 & 2
65	59	U. Jaw	P	3 mos.	Oesophagus	XR	4 mos.	1 & 2
66	64	Tongue	P	6 mos.	Stomach	D. C.	1½ yrs.	1 & 2
67	59	Tongue	P	8 mos.	Intestine	D. C.	8 mos.	2
68	65	U. Jaw	P	1½ yrs.	Sigmoid	Op.	3 yrs.	1 & 2
69	45	L. Lip	P	2 yrs.	R. P. S.	Op.	3 yrs.	2
70	66	Tongue	P	4 yrs.	Prostate	XR	6 yrs.	2
71	68	L. Lip	P	4 yrs.	Stomach	D. C.	4 yrs.	2
72	75	L. Lip	P	7 yrs.	Bladder	D. C.	7 yrs.	2
73	55	Tongue	P	7 yrs.	Oesophagus	XR	7 yrs.	2
74	78	L. Lip	P	8 yrs.	Pancreas	D. C.	8 yrs.	2
75	56	L. Lip	P	11 yrs.	Prostate	D. C.	11 yrs.	2
76	70	Floor	C	None	Bladder	D. C.	3 mos.	1 & 2
77	75	Cheek	C	1 mo.	Prostate	D. C.	1 mo.	2
78	68	L. Jaw	C	1 mo.	Oesophagus	XR	1 mo.	1 & 2
79[1]	76	Cheek	C	4 mos.	Bladder	D. C.	4 mos.	1 & 2
80	61	Tongue	C	6 mos.	Bowels	D. C.	6 mos.	1 & 2
81	75	L. Lip	C	6 mos.	Bladder	D. C.	6 mos.	1 & 2
82	88	L. Lip	C	1 yr.	Intestine	D. C.	1 yr.	2
83	65	Tongue	C	1 yr.	Liver	D. C.	1 yr.	2
84	88	Lip	C	1 yr.	Liver	D. C.	1 yr.	1 & 2
85	81	Palate	C	2 yrs.	Stomach	D. C.	2 yrs.	2
86	81	Floor	C	3 yrs.	Rectum	D. C.	3 yrs.	2
87	65	L. Lip	C	3 yrs.	Oesophagus	D. C.	3 yrs.	2
88	42	L. Lip	C	4 yrs.	Sigmoid	D. C.	4 yrs.	2

[1] Also history of cancer of cheek six years before first of these.

Symbols: D. C.—Data from Death Certificate
L & W—Living and Well
XR—X-ray Diagnosis
R. P. S.—Retroperitoneal Sarcoma

TABLE VIII

TWO MOUTH CANCERS AND ONE OTHER

Case No.	Age	Location of 1st	Evidence	Time Interval	Location of 2d and 3d	Evidence	Time from R of 1st to End Result	Cause of Death
89	66	Tongue	P	None	Tonsil	P		
				8 mos.	Bladder	D. C.	8 mos.	1, 2, 3
90	70	Cheek	P	3 yrs.	Cheek	C		
					Stomach	D. C.	4 yrs.	2, 3

TABLE IX

THREE OR MORE MOUTH CANCERS

Case No.	Age	Location of 1st	Evidence	Time Interval	Location of Later	Evidence	Time from R. 1st to End Result	Cause of Death
91	53	Cheek	P	4 yrs.	L. Jaw	P		
				6 yrs.	Cheek	P	6 yrs.	L c 3
92	62	L. Jaw	C	3 yrs.	L. Lip	P		
				4 yrs.	L. Jaw	P	4 yrs.	3
93	65	Tongue	P	None	Floor	P		
				2 yrs.	U. Lip	P		
				2 yrs.	L. Lip	C	5 yrs.	3, 4
94[1]	71	L. Lip	P	1 yr.	L. Lip	C		
					U. Lip	C	1½ yrs.	2, 3

[1] Also history of two previous lip cancers six and fourteen years before.

TABLE X

EXPECTANCY OF DYING PER 1000 POPULATION

BY AGE GROUPS AND TIME INTERVALS

Massachusetts Males 1920-1930

Time Intervals Years:	.02	.06	.17	.38	.75	1.5	2.5	3.5	4.5	6	8.5	11
Age Group												
0-35 (32½)	.088	.264	.748	1.94	3.30	6.8	11.7	16.8	22.1	30.6	46.8	66.3
36-40 (38½)	.128	.384	1.09	2.43	4.80	9.8	17.0	24.6	32.7	45.7	69.0	95.1
41-45 (43½)	.180	.540	1.53	3.42	6.75	13.9	23.6	33.4	43.7	60.5	92.6	130.
46-50 (48½)	.244	.732	2.08	4.64	9.15	18.4	31.6	45.7	60.6	84.7	131.	183.
51-55 (53½)	.352	1.06	2.99	6.69	13.2	27.1	48.6	67.0	89.0	124.	187.	255.
56-60 (58½)	.524	1.57	4.45	9.95	19.6	39.7	67.4	96.1	121.	172.	261.	356.
61-65 (63½)	.740	2.22	6.29	14.1	27.8	56.9	97.7	139.6	183.	250.	353.	483.
66-70 (68½)	1.14	3.42	9.70	21.7	42.8	86.7	145.2	204.	263.	350.	490.	615.
71-75 (73½)	1.64	4.92	13.9	31.2	61.5	122.8	202.	280.	353.	456.	613.	748.
76-80 (78½)	2.26	6.78	19.2	43.0	84.7	167.	270.	369.	462.	588.	758.	873.
81+ (83½)	3.3	9.90	28.	62.7	124.	246.	387.	512.	618.	744.	878.	947.

TABLE XI

EXPECTANCY OF DYING OF CANCER PER 10,000 POPULATION
BY AGE GROUPS AND TIME INTERVALS

Massachusetts Males 1920-1930

Time Intervals Years:	.02	.06	.17	.38	.75	1.5	2.5	3.5	4.5	6	8.5	11
Age Group												
0-35 (32½)	.37	.112	.318	.71	1.40	2.60	4.90	6.60	8.90	12.7	20.2	29.8
36-40 (38½)	.054	.162	.459	1.03	2.12	4.20	7.40	10.9	14.9	22.1	40.0	67.4
41-45 (43½)	.100	.300	.850	1.90	3.75	8.20	14.9	23.1	33.0	50.5	86.2	132.
46-50 (48½)	.240	.720	2.10	4.56	9.00	18.8	32.6	47.8	64.8	94.1	157.	243.
51-55 (53½)	.406	1.22	3.46	7.72	15.2	32.1	56.8	84.7	117.	170.	278.	406.
56-60 (58½)	.740	2.22	6.30	14.1	27.8	67.9	101.	147.	196.	276.	428.	603.
61-65 (63½)	1.12	3.36	9.50	21.3	42.0	84.3	146.	211.	280.	390.	595.	824.
66-70 (68½)	1.54	4.62	13.1	29.2	57.7	118.	202.	290.	382.	526.	774.	1033.
71-75 (73½)	2.04	6.12	17.3	38.8	76.7	152.	246.	352.	453.	623.	902.	1182.
76-80 (78½)	2.16	6.48	18.4	41.0	81.0	174.	292.	410.	528.	705.	1010.	1309.
81+ (83½)	2.34	6.98	20.2	44.3	87.4	189.	316.	445.	574.	768.	1089.	1408.

TABLE XII

EXPECTANCY OF DYING OF BUCCAL CANCER PER 100,000 POPULATION
BY AGE GROUPS AND TIME INTERVALS

Massachusetts Males 1920-1930

Time Intervals Years:	.02	.06	.17	.38	.75	1.5	2.5	3.5	4.5	6	8.5	11
Age Group												
0-35 (32½)	.011	.032	.09	.21	.44	.90	1.6	2.4	3.3	5.0	8.1	15.2
36-40 (38½)	.024	.072	.21	.46	.90	2.2	4.1	6.3	8.9	13.8	26.0	43.7
41-45 (43½)	.070	.210	.595	1.33	2.62	5.5	10.2	15.6	22.0	33.4	59.0	93.6
46-50 (48½)	.138	.414	1.17	2.62	5.18	12.6	22.4	33.6	46.3	68.3	116.	176.
51-55 (53½)	.280	.840	2.38	5.32	10.5	24.0	42.5	62.9	85.4	123.	198.	293.
56-60 (58½)	.540	1.62	4.59	10.3	20.2	39.6	68.8	101.	136.	196.	314.	446.
61-65 (63½)	.780	2.34	6.63	14.8	29.2	63.5	110.	159.	210.	290.	434.	690.
66-70 (68½)	1.08	3.24	9.18	20.5	40.5	82.0	139.	199.	260.	355.	529.	731.
71-75 (73½)	1.24	3.72	10.5	23.6	46.5	98.5	167.	239.	317.	441.	678.	945.
76-80 (78½)	1.68	5.04	14.3	32.9	63.0	131.	224.	323.	426.	591.	894.	1202.
81+ (83½)	1.84	5.76	15.9	36.3	76.0	183.	294.	417.	540.	728.	1038.	1210.

METHYLENE BLUE IN THE TREATMENT OF URINARY TUBERCULOSIS*

BY BORIS E. GREENBERG, M.D.,† AND M. LEOPOLD BRODNY, M.D.†

OUR present views on the subject of renal tuberculosis have, for the most part, been formulated since the beginning of this century. In this short period certain elementary facts have been promulgated in the pathology and diagnosis of the disease which serve as a basis for treatment. A brief résumé of these facts will more clearly present the problem and purpose of this paper.

The primary problem in renal tuberculosis is the early diagnosis and the determination of unilateral or bilateral kidney involvement. It is universally accepted that nephrectomy is the treatment in all cases in which unilateral tuberculosis is found. Through the removal of the diseased kidney a cure or at least a pronounced and prolonged improvement can be accomplished in the majority of cases. Nothing, however, is more variable than the course of the bladder symptoms after nephrectomy. It is impossible to give a definite prognosis, but according to statistical data about 40 per cent of the operative cases are cured, 50 per cent are improved, and in 10 per cent there is either no improvement or an exacerbation of symptoms. In many of the cases it is months before symptomatic relief is noted. In the interim, treatment must be instituted to alleviate suffering.

The majority of urologists believe that renal surgery is unwise and contraindicated in most cases of bilateral involvement. There has never been reported a single authentic proved case of renal tuberculosis which has been medically cured. Palliative symptomatic therapy is the only treatment that can be offered to the patient with bilateral renal tuberculosis.

The purpose of this paper is to present the use of methylene blue as a palliative agent for the relief of the symptoms of vesical tuberculosis.

In the majority of cases the disease is probably present in the kidney for a long period of time during which it may cause tissue destruction without producing any symptoms. The typical clinical symptoms start with the involvement of the bladder. Primary vesical tuberculosis, although theoretically possible, is a very rare occurrence. In 80 to 90 per cent of the cases bladder tuberculosis is secondary to the renal infection, and in 10 to 20 per cent to genital involvement.

The symptoms of tuberculous cystitis are insidious in their onset and increase in severity as the bladder becomes more involved. The most common symptom is frequency. This has been found to be present in 62 to 82 per cent of the cases of genito-urinary tuberculosis. At first, the frequency of urination is about every two hours during the day and once or twice at night. As the disease progresses, the frequency increases to every few minutes day and night. In advanced cases the desire to urinate becomes almost constant leading to spasmodic incontinence. The bladder becomes irritable and diminished in capacity. The patient voids frequently in small amounts and has marked tenesmus which is caused by the spasmodic contractions of the irritated vesical neck. Pain, either suprapubic, urethral, or lumbar, is present in about 25 per cent of the cases. The urethral discomfort is a burning sensation rather than pain and is due to irritation by the highly acid urine which is characteristic of this disease. At the beginning, the patient's general condition may be good, then, due to the lack of sleep, poor appetite, and often the presence of secondary infection, he loses weight, becomes pale, and develops generalized weakness.

The treatment of tuberculous cystitis with the usual and varied therapeutic agents has on the whole proved unsatisfactory. Many of the drugs commonly used in other types of infection are definitely contraindicated. A review of these drugs from a therapeutic, physiological and pharmacological viewpoint, demonstrates the dangers and ineffectiveness of their use.

REVIEW OF PRESENT METHODS OF TREATMENT

Carbolic Acid

This method was originated by Rovsing. He employed a six per cent warm carbolic acid solution to irrigate the bladder.

Bichloride of Mercury

Guyon introduced bichloride of mercury as a remedy for tuberculous cystitis. Solutions of the strength of 1-10000 to 1-1000 are instilled into the bladder not oftener than bi-weekly. More recently other mercurial salts, such as the perchloride and the oxycyanate have been substituted for the bichloride.

Hollander's Method

Hollander's method of treatment is also extensively in vogue. Potassium iodide is given internally and a few hours afterwards a calomel emulsion in oils is instilled into the bladder. The mercuric iodide that is formed intravesically is slightly caustic and analgesic and has a good effect on the infection.

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Lactic Acid

Witzack recommended the use of lactic acid, in solutions as strong as 20 per cent, in the form of instillations.

These methods have many disadvantages:

1. The treatments are painful to such an extent that morphine injections in fairly large doses for a long period are required to make the procedure tolerable.
2. These caustics affect the uninvolved mucous membrane of the bladder, injure it, and lower its resistance.
3. The drugs are not tolerated by many patients. Systemic reactions are frequently observed.
4. The desired therapeutic effect is not always obtained.

Drugs which are contraindicated in tuberculosis

It is generally agreed that silver nitrate, argyrol and other silver salts are definitely contraindicated. It is a well-known fact, first observed by Guyon, that if the symptoms of vesical cystitis are aggravated by silver salts given in proper dilution and frequency, the infection is very suspicious of tuberculosis.

Hexamethylenamin is in the same category and is not to be used. The formaldehyde freed from the drug is irritating to the injured parenchyma of the kidney. Walcher (cited by Blanc) says that, while the action of the formalin is of no importance when the kidney epithelium is intact, it becomes injurious if an inflammation is developing. Blanc reported some cases of tuberculous cystitis in which hexamethylenamin was given and the bladder pain was increased and sometimes hematuria brought on. Our experience has been the same.

Tuberculin

The therapeutic value of tuberculin in this condition is questionable and may even be contraindicated because of its marked anaphylactic effect. However, Creasy was very enthusiastic about its use and presented a few cases with excellent results. Thomas Walker claimed many successes for tuberculin treatment. However, Young states, "The use of tuberculin has been very disappointing in our hands." The results on the whole have been unsatisfactory.

Other Drugs

Such therapies as vapors of nascent iodine, injections of lactic acid bacilli, mercurochrome by mouth, sodium or iron cacodylate hypodermically, ether vapor and sterile organic oil injections are questionable in their curative properties and do very little to relieve the symptoms. We have had no experience with sanocrysin, which Rovsing claims diminishes vesical tenderness, or with the acridine dyes, such as rivanol, with which the German urologists are said to have obtained good results. According to the discussion by Fleming, at a meeting of the Royal Society of Medicine, sanocrysin in tuberculosis has proved disappointing and dangerous. From the multiplicity of drugs and the lack of agreement as to the mode of therapy, the difficulties of the treatment are made more apparent.

Methylene Blue

Methylene blue has been used for the treatment of tuberculosis for a number of years, but Blanc was the first to emphasize its use for renal tuberculosis, and his enthusiasm led us to try it. We have modified his methods.

Methylene blue is a dark bluish green crystal with a metallic lustre, odorless, very stable, and freely soluble in water and alcohol. It is a blue dye of the thiozine group with a formula of C16 H18 N35 cl. H20, and a molecular weight of 373.7. The dye was first isolated by Caro in 1876. As early as 1880 methylene blue was suggested as an internal antiseptic, because of its supposed toxicity to the lower forms of animal and plant life. In 1885 Bernthsen established its constitution together with its relationship to thionine. Methylene blue has a selective affinity for living chromatin and the axis cylinders of nerve fibres. In 1891 Ehrlich, led by its selective action on the staining of the sensory nerve endings, introduced it as an analgesic. Since the plasmodium malariae was easily and deeply stained by it, he also suggested its practical use in the treatment of malaria. It has a slight diuretic effect, as Tanfiljeff showed that in a considerable number of rabbits the quantity of urine became increased following protracted administration of the dye. It has been used unsuccessfully as an antiseptic in gonorrhea, cystitis, and pyelitis, and as an analgesic in neuralgia and sciatica, but its value is not great. Externally, methylene blue has been used in tonsillitis, erysipelas, conjunctivitis, and stomatitis. It has been used in the textile industries as a dye, in the chemical laboratory in various tests, and as a bacterial stain.

Care must be taken not to confuse methylene blue with methyl blue, which is a dye of a different structure, and is not to be used in or on the human body. Impure commercial forms of methylene blue should be avoided. This is very important, since the use of the impure methylene blue by a physician who tried this form of therapy caused vesical irritation and aggravated the symptoms. Zinc and arsenic are the most common impurities found in methylene blue. They should not be present beyond the maximum U.S.P. limits, which are 0.150 per cent and .007 per cent respectively. The drug is incompatible with potassium hydroxide, potassium dichromate, potassium iodide, and sulphuric acid.

The addition of various organic and inorganic

substances to the dye changes its color. The importance of this phenomenon will be stressed when we discuss the leucoform of methylene blue in the body. The dye is somewhat soluble in chloroform and gives a deep blue color. Hydrochloric acid and methylene blue mixed in watery solution give a light shade of blue. On adding a moderate quantity of sodium hydroxide to a watery solution, a purplish shade is obtained. An excessive quantity of sodium hydroxide added to the same watery solution gives a dull violet precipitate. Concentrated sulphuric acid dissolves methylene blue and gives a green color. A solution of methylene blue and nitrous acid forms methylene green. By means of other reducing agents, this substance is readily transformed into its leucoform, leuco-methylene green, which rapidly oxidizes on exposure to moist air and is changed back to the original form. The change to leucoforms plays an important part in the therapy with methylene blue.

In malaria, according to the United States Dispensatory, the dye may be given in 10-20 grain divided doses, daily for ten days, without harmful effects. Its toxicity is low. There has never been a fatal case reported from administering the pure drug. The fatal dose for dogs and rabbits exceeds 1 grain per kilo of body-weight. Its continued use is harmless. Hypodermically, however, methylene blue should not be used because it may produce ulcers and abscesses.

The drug has been given by mouth in capsules or coated pills and is absorbed very rapidly, often appearing in the urine as early as fifteen minutes after ingestion. Tanfiljeff was of the opinion that the dye circulated in the body in the form of a reduced colorless compound. The dye is distributed to all the tissues in minute quantities. Turchin, in his studies on the mechanism of excretion of methylene blue, pointed out that in the kidney the drug accumulates in the various cells as well as in the intertubular spaces, penetrates into the interior of the cells of the convoluted tubules, and is eliminated into the lumen by dialysis, constituting a true impregnation of the urinary tract. A small portion of the dye is probably reabsorbed by the lower urinary tract. From 50 per cent to 70 per cent was excreted by the kidneys, four per cent to eight per cent was found in the stools, and traces were found in the saliva and sweat. The rest could not be accounted for. Elsner suggested that the dye unaccounted for may be deposited in the tissue somewhere or may be excreted in a leucoform that cannot be oxidized.

Hinman, from personal studies, wrote that the dye was a very weak germicide and would not kill staphylococcus, streptococcus, or bacillus coli under twenty-five minutes, even in 1/10 dilution; but as a bacteriostatic, its action was very selective and it powerfully inhibited the staphylococcus in 1-150,000, streptococcus 1-80,000, and bacillus coli in 1-1000 dilution. The drug is practically inactive antiseptically in the leucoform. The presence of the dye in the urine of tuberculous patients has been considered a factor in the prevention of secondary infection, especially after vesical manipulations.

Sherman demonstrated that the tubercle bacillus was stained deeply by methylene blue in a short time. DeWitt tested twenty dyes which stained and penetrated the tubercle bacillus and had some bactericidal power, and showed that methylene blue penetrated the tubercle bacillus well, and stained it sharply, and had, in vitro, some bactericidal power and considerable inhibitory action over growth. The tubercle bacillus was easily stained in the living animal body. The dye penetrated the tubercle in vivo, where it was reduced and could be reoxidized.

Frau Grafin von Linden treated six guinea pigs infected with tuberculosis with methylene blue iodide. Under her treatment, the temperature curve was more nearly normal, the pigs lost less weight, and lived nearly double the average length of time of the controls. There was less extensive involvement, slower dissemination and more rapid evidence of healing of the tuberculosis in the treated than in the untreated cases. DeWitt's findings in similar experiments are not quite so remarkable as those of Frau Grafin von Linden, but even her results show much less extensive disease in the treated cases than in the controls. However, no experimental evidence has been presented of the cure of a single animal. In the clinical cases of urinary tuberculosis, we have observed an increase in the patient's appetite and weight under the methylene blue therapy.

PRESENT INVESTIGATION

The technic of our method of treatment is important. It consists in more than giving a few pills by mouth and instillations into the bladder. Minor technical points which apparently are superfluous may be the deciding factor in the success or failure of treatment. It is for this reason that we are giving in detail the technic which we have followed.

We have administered the dye in two grain doses, in capsules or pills, three times daily for three weeks, which dose is much smaller than the maximum non-toxic dose. The drug was then temporarily discontinued for a week to allow the body to excrete any excess which may have accumulated. Occasionally at the beginning of such treatment the patient developed diarrhea or slight nausea, but if the drug was omitted for 48 hours these symptoms disappeared and usually did not recur on resuming it. Except

for these mild temporary disturbances, we have seen no ill effects from the oral administration of methylene blue in patients with tuberculosis of the urinary tract. However, in some patients with non-tuberculous renal and bladder infection, frequency, nocturia, and even burning was brought on by taking the dye.

In order to bring a more concentrated solution of methylene blue into more direct contact with the tuberculous lesions in the bladder, a solution of the dye was instilled intravesically. The proper preparation of this solution is of the utmost importance. A 1.0 per cent solution of chemically pure powdered methylene blue (U.S.P.) is made in sterile physiological salt solution at room temperature, and the solution is then filtered.

If this solution should precipitate on standing, it is to be discarded. A well-lubricated catheter is then passed through the urethra, under aseptic precautions, and the bladder is repeatedly irrigated with small quantities of sterile, distilled, warm water until the returning fluid is clear. Distilled water is the best medium to use because it is bland and non-irritative, and is a mechanical cleanser. No more than 15.0 cc. of the 1.0 per cent methylene blue solution was then instilled into the bladder, the catheter was withdrawn, and the patient was instructed not to urinate for one hour. Occasionally, with very irritable bladders of small capacity, in the beginning of treatment, much smaller amounts, even as little as 3 cc., may be tolerated. As the capacity of the bladder increases, the amount of the solution introduced should be increased. These instillations are given twice a week for four weeks and then discontinued for one week. In milder cases, or as symptoms improve, instillations at weekly or even bi-monthly intervals will suffice.

In addition to the above modification of Blanc's treatment with methylene blue, we have found that additional procedures are useful in the treatment of genito-urinary tuberculosis. Of outstanding importance are intra-vesical mineral oil instillations and alkalinization of the urine. Our procedures in these directions will now be given. The bland mineral oil is sterilized in the autoclave, allowed to cool, and heated to body temperature when it is needed. Up to four ounces of the oil, depending on bladder capacity, is carefully and aseptically instilled into the bladder. Some of the oil remains in the bladder for a week, during which time droplets are continually found in the voided urine. In patients with residual urine, the oil may remain in the bladder for three to four weeks before being completely evacuated. The frequency of these instillations varies with each individual case, and is dependent on the severity of symptoms and the speed and degree of evacuation of the oil from the bladder. In the majority of patients, instillations once a week will suffice.

Alkalinization of the urine is theoretically and practically indicated since one of the characteristics of genito-urinary tuberculosis is the highly acid urine. This is in marked contrast to some other forms of cystitis in which the urine is usually alkaline. We counteracted the acidity in two ways: first, by giving alkali orally, and secondly, by alkaline irrigations intravesically. At the onset, the alkali is given by mouth in large amounts. The patient is then kept on a maintenance dose. We have used an effervescent carbonated salt since it is pleasant to take, is well tolerated and tends to neutralize the urine. We have given it in doses of a dram three or four times daily for six weeks, and then omitted it for two weeks. A one per cent to three per cent solution of sodium bicarbonate was used as a vesical irrigation or was instilled into the bladder and left there for five or ten minutes. Once a week, before giving the methylene blue instillations discussed above, the bladder is irrigated with the warm sterile alkaline solution and about one to three ounces are allowed to remain in the bladder for ten minutes. The bladder is then washed with the warm sterile water and the dye instilled as above described.

In addition to the above procedures discussed in detail, the modus operandi of the treatment of bladder tuberculosis contains a few axioms which are of prime importance and must constantly be kept in mind. The above treatment of urinary tract tuberculosis is not a substitute for surgery, and the opportunities for a surgical cure should not be overlooked. Also, the principles of sanatorium treatment are indicated in the majority of cases. Fresh air, sunshine, rest, hygienic living and proper sanitation help these patients almost as much as they do the pulmonary cases. Extreme mental and physical exertion in all forms should be avoided. The diet should be plain, substantial, and strengthening. The careless passing of a cystoscope or a sound or any other instrument may cause injury to the tissue from which a tuberculous ulcer may develop. In the male, if conservatism and care are not exercised, the genitals may be infected, causing serious complications. The oils and fluids used for instillations and irrigations should be warmed to body temperature before using. Only small quantities of fluid should be used when irrigating. The small contracted bladder found in these patients is easily overdistended, causing pain and delaying treatment. All ocean bathing should be prohibited. A number of patients have had severe exacerbations of vesical symptoms following visits to the beach because of the cold or salt of the ocean water.

DISCUSSION

In a previous article on therapeusis with mineral oil, we reported that the instillation of bland mineral oil into the infected bladder greatly alleviated the irritability and tenesmus, and facilitated micturition. There is probably no condition in which this form of therapy gives better results than in vesical tuberculosis. All the other oils previously used have been organic, the chief ones being olive oil, gomenol, oil of eucalyptus, and eucupin. The following are objections to all these organic oils:

1. They are irritating, a factor which instead of preserving threatens to destroy vitality of tissues and is to be avoided in treating vesical tuberculosis.
2. They are painful and require sedatives.
3. Organic oils become rancid, and therefore acid in reaction.
4. The healthy tissue is affected. Oil, such as gomenol, for instance, coats the uninvolved mucous membrane. On subsequent cystoscopic examination the healthy tissue appears irritated and inflamed.

Mineral oil is non-irritating, neutral in reaction, and does not become rancid. It adheres to the bladder mucous membrane, mechanically facilitating urination, and relieving symptoms.

It is useful in controlling the bleeding from tuberculous bladders. Its use as a cystoscopic medium in tuberculosis has been previously reported by one of us[18]. Finally, it is a valuable medium with which to dilate the bladder. The tuberculous contracted bladder can be dilated with mineral oil to twice the capacity possible with boric solution. The pain and discomfort of the procedure are also diminished.

Previously guaiacol carbonate had been used orally in vesical tuberculosis to neutralize the urine and to present guaiacol which is supposed to be of some antiseptic value in tuberculosis. Hess has shown, however, that the absorption of this drug from the gastro-intestinal tract is very poor, and that it is of questionable value when given orally. Haslinger substituted sodium bicarbonate, which he claims has a diuretic effect on the kidneys and an analgesic effect on the bladder. He gives it initially in doses of a tablespoonful three times a day. We have substituted an effervescent carbonated salt and find it equally effective and pleasanter to take. Haslinger quotes Bauer as having demonstrated experimentally that alkalis produce swelling of the mucous membrane of the bladder. This is especially true of the tissues of the base and at the border of a tuberculous ulcer. Thus it helps to loosen the secretory products, resulting in improvement of symptoms.

The oral administration of methylene blue is indicated in every patient with genito-urinary tuberculosis, with the exception of nephritics, in whom there is poor excretion. In these patients, there is some danger of a systemic retention and accumulation of the dye. The vesical instillations are indicated in every case of tuberculous cystitis. The only dangerous part of the procedure is the passage of catheters through the male urethra. If extreme care is not exercised, the posterior urethra may be traumatized and the infection extended to the epididymes, with resulting serious complications. In the male patient with genital involvement, there is danger of lighting up a chronic infection, and in such instances we have omitted all instillations. We have treated these patients only by oral therapy, and consequently our results with them have been less satisfactory.

Many theories have been advanced to explain the action of methylene blue. Early investigators observed the elective affinity and selective fixation of the dye on living chromatin, leucocytes, bacteria, and especially nerve endings. Attempts have been made to explain its action on the basis of this property. Blanc believed the dye exercised an anti-neuralgic and sedative action by impregnation of the nerve cells of the tissues with which it came in contact, either by elimination or absorption. Olivieri explained the analgesic effect of methylene blue by its specific affinity for the nerve endings. This theory does not completely and adequately explain the selective action of methylene blue in tuberculous cystitis, nor does it take into account the influence of the reduction of the dye into its various inactive leucoforms.

There are many observations pointing to a direct action of methylene blue on the tuberculous lesions. Blanc pointed out that methylene blue has an elective affinity for diseased tissue. We can confirm his observations on the basis of cystoscopic and pathologic evidence. If a patient who has a tuberculous vesical ulcer, and has been taking methylene blue, is cystoscoped, the normal mucous membrane of the bladder is unstained and the area of ulceration is stained light blue in the center and dark blue at the edges. We have made a similar observation on a surgically removed kidney. On bisecting the specimen removed in the third case reported below, the caseous areas were stained blue while the remainder of the renal tissue was unstained. These caseous areas were a faint blue in the center with increasing intensity of coloration toward the borders, which were a very dark blue and resembled a halo. Olivieri observed that the dye, when acting upon living tissue, was reduced to a colorless substance called leucolose, and that dead tissue and microörganisms take up the dye without reduction or decolorization. Our observations would also indicate that the dye is present in the tuberculous areas in the unchanged form.

Methylene blue probably also acts directly on the tubercle bacillus. The experiments and observations of DeWitt on the penetrating, stain-

ing, and bactericidal power of the dye have already been cited. Tubercle bacilli, vitally stained with methylene blue and placed under anerobic conditions, change the dye to its leucoform. Pfeiffer investigated the reducing power of tuberculosis on methylene blue. He proved that tuberculous patients had a marked power to reduce methylene blue to the leucoforms. He showed that blood had this power of reduction. Blood from patients with tuberculosis was more active in this respect than blood from patients with other diseases or normal individuals, although blood serums alone did not differ. Pfeiffer also demonstrated that lung tissue containing tuberculous lesions was especially active in reducing the dye. He thought that the absence or delayed excretion of the dye in tuberculosis might be accounted for by its marked affinity for the tubercle bacillus by which it is "anchored" and changed before being excreted.

It is also possible that the action of the dye may be related to enzymatic or metabolic changes in the cells. Hinman suggested that the absence of a deep color in the urine, after taking methylene blue, may be due to metabolic decomposition of the dye. Olivieri believed that the reduction of methylene blue, by living tissue, is brought about by metabolic changes in the cells, especially by enzymes. Eisendrath and Rolnick advanced the theory that the tuberculous kidney contained some toxic substance which, by its irritation of the epithelial lining of the bladder, stimulated the sensory nerve endings and set in motion the reflex mechanism to empty the bladder. It is possible that the dye relieves the symptoms of vesical tuberculosis by acting on these toxins.

We have treated 15 cases within the last three years. The following cases show typical results of this treatment.

CASE 1. M. H., widow, aged 49, entered the hospital complaining of suprapubic pain of two years' duration, which radiated to the left lumbar region. The pain was intermittent in character, and attacks lasted from a few minutes to hours. The patient also complained of severe burning on urination, frequency every half hour, and nocturia eight times. Her past history was essentially negative except for a prolonged cough through the winter, eight years previously. We were unable to trace any contact with tuberculosis. Examination of the lungs showed dullness over the right apex. The bladder urine was cloudy and acid, with a specific gravity of 1.002 and a trace of albumin. The sediment contained many pus cells and a few red corpuscles. Gram stain showed many positive cocci. No tubercle bacilli were found. Cystoscopic examination revealed a bladder of small capacity with an inflamed mucous membrane. There were ulcerations around the right ureteral orifice. The left orifice was golf hole in type. Intravenous urography showed definite findings in the kidney, which were consistent with a tuberculous process of the left side. The guinea pig inoculation, however, was positive for the urine specimens obtained from both the right and left kidney. The patient was referred to a sanatorium and immediately started on the above treatment. At the end of four weeks, she could hold her urine for 2½ hours, and her nocturia was reduced to four times. The suprapubic pain was diminished, and the attacks were less frequent. Her bladder capacity was increased to six ounces by gradual dilatation with sterile mineral oil. Her appetite improved and she gained six pounds in weight. At the sanatorium, methylene blue treatment was then discontinued for one month. All her symptoms returned to their severity. The patient was then put back on our treatment. The last report from the sanatorium, one year later, showed the patient markedly improved. She voids every three hours, and only twice at night. Her appetite is good. She has gained eighteen pounds in weight.

CASE 2. (The following was a case of bilateral renal tuberculosis that was operated upon with resulting severe postoperative symptoms.) R. G., housewife, aged 26, entered the hospital complaining of dysuria, frequency, and hematuria. About four weeks after falling down a flight of stairs, the patient developed frequency and burning on urination. She had an attack of hematuria seven weeks before entry. Physical examination revealed diffuse tenderness over the abdomen, particularly suprapubically. The right kidney was palpable and tender. X-ray of the chest revealed evidence of a healed pulmonary tuberculosis. The ureteropyelographic examination of the left side showed the pelvis to be of normal size and regular in contour. The calices showed normal cupping. The right ureter was not injected. The urines from both kidneys contained pus, and tubercle bacilli were found on stained smears. The discharge diagnosis was bilateral renal tuberculosis. This was before we used methylene blue. One year and six months later this patient was seen in consultation after a nephrectomy on the left side had been done by another surgeon. She was extremely ill, with constant hematuria, urgency, and frequency. For the previous two months she had been confined to bed. Her weight at that time was 92 pounds. She was started on vesical instillation of small amounts of mineral oil daily for one week, and then two to three times weekly. At first, methylene blue instillations were given once a week, but were increased within a month to three times a week. She was also given capsules of methylene blue by mouth. She gained gradually and within three months weighed 104 pounds. Her hematuria ceased, and the symptoms of dysuria improved. After two years of treatment, the patient had no nocturia, no hematuria, and no urgency. Her bladder capacity has increased from one half ounce to eight ounces. Her present weight is 128 pounds.

CASE 3. E. G., aged 30. Patient admitted complaining of urgency, frequency, and nocturia. Previous admission No. 7405 old B.I.H. Entered the hospital on September 30, 1926, and was discharged October 14, 1926. Diagnosis: bilateral renal tuberculosis. Four years in Lakeville Sanatorium. Urinary symptoms increased in severity, especially during the past month. Physical examination showed left ear drum perforated, canal full of débris and discharge; otherwise negative. Urine examination on admission showed 40-50 w.b.c.; v.s.t. of albumin. On discharge s.p.t. of albumin and no cells. W.B.C. on admission 12,900 Hgb. 80 per cent. N.P.N. 31-34. Hinton, Kahn and Wassermann negative. On December 27, 1930, uroselectan was given; left kidney not outlined; some calcified bodies in left lower pole. On December 23, 1930 cystoscopy was done; left ureter could not be catheterized; right side catheterized. Pyelogram done. Renal function showed a right 11 per cent, left estimated from bladder three per cent. Sediment on right, 0 TB, 3-5 w.b.c. Bladder was positive for TB on three occasions. Culture from left ear negative for TB, showed pneumococcus, streptococcus, and B. coli on two oc-

casions. Pyelogram of right kidney showed kidney to be essentially normal, therefore operation was advised. On December 30, 1930 nephrectomy was done under spinal anesthesia. Following operation, she was kept on methylene blue by mouth and instillations into the bladder. Postoperative course was uneventful. Wound healed well. The patient was discharged January 17, 1931. The condition was much improved.

It is now two years since her operation. She has been constantly under observation and treatment. She has gained 25 pounds in weight, and is back at work. She urinates every four hours and once at night, without burning or pain. Her urine is now negative for the tubercle bacillus. For the past 15 years she had a continued discharge from the ear and complete deafness. At no time could the tubercle bacillus be found by smear or guinea pig inoculation. Many different forms of treatment at various clinics were tried without improvement. At our suggestion, instillation of methylene blue into the diseased ear was given by the Ear, Nose and Throat Service. In two months the discharge completely disappeared and the lesions healed. However, the patient is still deaf in that ear.

CASE 4. F. C., an Italian leather worker, aged 27, single, entered the hospital complaining of urgency, frequency, and nocturia for 17 months. Six years previously the patient had been discharged from a sanatorium where a diagnosis of arrested pulmonary tuberculosis had been made. For a year and a half before entry he had complained of dull pain in the left costovertebral angle, hematuria, increasing frequency, and nocturia. The physical examination showed a lean, emaciated young man. There was evidence of healed tuberculosis in both apices of the lungs. The rectal examination showed a moderately enlarged, boggy prostate, which was suspicious of tuberculosis. The bladder urine had a specific gravity of 1.010, was loaded with pus cells, and was acid in reaction. The gram stain of the sediment showed many staphylococci and a few gram positive bacilli. Tubercle bacilli were found on staining with carbol fuchsin. Pyelographic findings were consistent with a tuberculous lesion in the left kidney. A psoas abscess was also seen by x-ray. A left nephrectomy was done under spinal anesthesia. The cross section of the removed kidney showed that the markings of the pelvis and calyces were obliterated. In the cortex there were numerous abscesses. A smear of the pus was stained and found to contain many tubercle bacilli. The calyces and caseous areas, especially one of the larger ones in the upper pole, were stained blue by the dye which the patient had received. Sections through a necrotic area which was stained blue showed a sharp line of demarcation at its junctional borders. Following operation, the patient continued to have symptoms and was put on a régime of methylene blue by mouth. It is now two years since his operation, his urine does not contain pus or tubercle bacilli, and he has nocturia twice and frequency every three hours. He has gained twenty pounds in weight and is back at work. On different occasions, when we have attempted to stop his methylene blue therapy his symptoms of burning, frequency, and nocturia have returned.

CONCLUSIONS

1. Methylene blue alleviates the symptoms of urinary tuberculosis more effectively than any other drug we have used.
2. Clinically, methylene blue increases the appetite and weight of patients with urinary tuberculosis.
3. Methylene blue is valuable in the diagnosis of renal tuberculosis. Tuberculous cystitis must be considered as a probable diagnosis in those patients in whom the symptoms of frequency and burning are markedly relieved by the dye therapy.
4. Alkalies are useful in combating and neutralizing the highly acid urine which is characteristic of urinary tuberculosis.
5. Vesical instillations of sterile mineral oil exercise a bland soothing effect, mechanically, on the tuberculous bladder.
6. All traumatic manipulations and irritative drugs should be avoided in the treatment of genito-urinary tuberculosis.

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STUDIES OF REPRODUCTION IN THE RAT*

II. The Effect of Changes in Energy Production Upon Fertility, Pregnancy and Lactation

BY DONALD MACOMBER, M.D.‡

THE first part[5] of these studies had to do with the effect of changes in the amount of protein intake upon reproduction. As a part of this same work the effect of changes in the total amount of food ingested was also investigated. Some mention of the results has necessarily been made in Part I. It will, however, be repeated for completeness. The actual methods and technique of the work with the animals were identical and need not be considered further. The diet was Diet I in its most ideal form;† and this was not changed for the work reported in this part. The only variation made was in the amount of food; this was restricted during part of the experiment.

The idea that changes in the amount of food might affect reproduction is not new. It has long been recognized that starvation produces profound changes in tissues and in body function. In Voit's[10] classical experiment the reproductive organs suffered more than any other organs except the liver. It was, however, not until the recent advances in the technique of animal experimentation that any study was made of changes in the amount of food upon function. In 1915 Osborne and Mendel[6, 7] found that growth could be more or less indefinitely "suppressed" by limiting the amount of food eaten. This work was continued by them and in 1918 Thompson and Mendel[9] published the results of a particularly illuminating study. They found that growth could be suppressed by limitation of food intake, but that when it was resumed, even after a prolonged interval, development and reproduction went on normally. These experiments were undertaken to show the effect of limitation of the food in suppressing growth. The fact that reproductive development was also suppressed was discovered incidentally.

At that time Stockard[8] had just published his fundamental work upon the estrous cycle of the guinea pig. This gave a much needed method of studying reproduction. It was followed by Long and Evans'[4] monograph on the estrous cycle in the rat in 1922. The same year Evans and Bishop[2] published their work on the effect of inadequate rations upon the ovulation rhythm in the rat. Three groups of rats were investigated. The first group weighed in the neighborhood of 200 Gm. each. With them the average intake of food as previously determined was slightly reduced but only enough to slow down the normal rate of growth. Under these conditions the age of first estrus (puberty) was lengthened from 50 to 67 days, and the occurrence of estrus in a year reduced from 55 to 25 or less. A second group—weighing on the average 125-150 Gm. apiece—had their daily ration reduced by one-third. There was practically no growth and little evidence of reproductive activity. First estrus did not occur before the end of the seventh month and in two instances never. In one year one had one estrous cycle; four, two; one, three and one, four. The third group weighed 60-85 Gm. each. These were placed on 50 per cent of the normal diet. None of them developed estrus at all. The most striking part of these experiments had to do with the 200 Gm. group. They were

*The experimental work upon which this paper is based was carried out in the Research Laboratory of the Department of Obstetrics, Harvard Medical School. It was aided by grants from the Delamar Fund.

†See Part I. Casein 20. Salt Mixture 4. Starch 51. Wheat germ 5. Yeast 2. Cod liver oil 2. Butter 16. In addition a small amount (10 Gm.) of fresh lettuce was fed daily. The protein was 0.2 Gm., the calories 4.7 per Gm. of food ingested.

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animals which appeared normal and which were actually growing. They were bigger and better looking than the "runts" which one gets in any group of growing animals on normal unlimited amounts of food, and yet their reproductive performance was far worse than that of the runts.

From the point of view of man the evidence that changes in the energy metabolism may affect reproduction is not so complete. Benedict[1] reported in 1919 the result of restricting food in young healthy men upon metabolism. A 33 1-3 per cent reduction in calories caused a fall in the basal metabolic rate of 18-20 per cent. No direct observations were made on reproduction, but such profound changes must have been associated with some functional disturbance of a system so susceptible to injury. In times of famine[3] it has been frequently noted that women suffer from cessation of the menses. It is also probable that more serious and permanent injuries may result.

It was determined to carry on a carefully planned investigation as to just what effect restrictions in diet might have on the total reproductive performance. This seemed the more important because of the prevalence of unsupervised dieting among women in general at the present time. It was also decided so far as possible to perform this work along quantitative lines. Diet I[5], as has been said, was chosen because of the fact that it gave a normal reproductive performance, the averages for which had been thoroughly worked out (see Part I). Before restriction, records were kept for fifteen days which showed that the average daily consumption of food was 11.4 Gm. (protein 2.39 Gm.—calories 55.5). On this 10 rats gained 24.4 Gm. each and all had regular estrous cycles occurring on the average of every 4.3 days. The amount fed to each rat was then limited to 8 Gm. per day (a reduction of 30 per cent). This yielded 1.68 Gm. of protein and 37.5 calories. The restriction was continued for fifty days and during this time the animals were observed for the frequency of estrus and then bred. For the first 25 days estrus averaged every 4.8 days. For the second twenty-five day period four animals had no estrus whatever. The remaining six became pregnant when mated at the time of estrus but only one of the six carried her pregnancy to term, giving birth to six young weighing 4.3 each (normal for six or more young on unrestricted diet being 5.25 or more).

The amount of food was then increased to 10 Gm. a day giving 2.10 Gm. of protein and 46.9 calories. On this five showed no sign of estrus, three had a period time averaging twelve days and one four and a half days. Only two animals became pregnant, but in neither instance did the animals remain on the limited diet for more than the first week.

Finally all ten animals were given an unlimited amount of the same diet, and all ten became pregnant and carried through to term. In spite of the fact that they had all been through a prolonged period of restricted food (68 days) with the profound effects just noted, the character of the reproductive performance was every bit as good as for the controls. (See table I.)

There are only two possible indications that the restricted diet caused any injury; the first is in the litter size of 8.7 as compared with the normal of 10.9, and the second in the number of mothers able to nurse. After the restriction only 50 per cent were able to raise young to weaning, whereas in the controls 80 per cent were able to do so.

TABLE I

	Pregnancy				*Lactation*			
	Ave. amt. of food eaten	No. young born	Ave. wt. young	Ave. gain mothers	Ave. amt. of food eaten	No. young nursed	Ave. wt. young at weaning	Gain or loss of mothers
Rats which had previously been restricted	14.2	8.7	5.61	42.7	29.3	8.8	34.6	±0
Control rats never restricted	14.5	10.9	5.25	21.3	24.2	7.6	36.2	—4.0

The changes, noted above, were produced by a relatively slight change in the total amount of food ingested, namely, a reduction of 30 per cent. But under this change reproduction practically ceased. The estrus interval was greatly prolonged—in 40 per cent to the point of complete suppression. Though pregnancy occurred in the other 60 per cent it ended in absorption except in one instance where six ill-nourished young were born. That these changes in reproduction were purely of a functional nature, and not due to any permanent injury, is shown by the normal performance as soon as they were returned to an unrestricted régime.

The question naturally arises as to just what change in the quantity or quality of the food caused these results. Could it have been due to the reduction in the amount of protein? On 8 Gm. the total amount of protein was 1.68 Gm. which is more than was eaten by the animals on 10 per cent protein (see Part I), namely, 1.44 Gm.; and the animals on 10 per cent pro-

tein showed relatively little slowing of the reproductive functions. It is possible that a 30 per cent reduction in some other element of the normal unlimited diet may have contributed to the result; the limitations of the experiment forbade further minute investigation. From other work, however, it would seem necessary to make much more than a 30 per cent reduction in any one element to produce such a striking change. It seems much more logical to attribute the results to the changes in general metabolism following restriction in the caloric intake. Further investigation is urgently needed in this most important field.

SUMMARY

The results of these experiments may be summarized as follows: when the total amount of food consumed by ten normal female rats was reduced 30 per cent the interval between periods of estrus was greatly prolonged (in 40 per cent to the point of suppression). Nine out of ten became temporarily sterile. In spite of these profound changes the animals appeared normal and lost only 30 Gm. each (15 per cent). When returned to an unlimited diet, reproduction was normal.

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MEDICAL PROGRESS

PROGRESS IN LARYNGOLOGY

BY LEROY A. SCHALL, M.D.*

INTRODUCTION

"IN the ocean,"—writes the Orator[1] of the Middlesex South District Medical Society, "wave follows wave; it is not the same wave, yet one causes another and transmits its form and movement." The laryngological wave of literature for the past year takes its movement and form from that of the preceding years. Deductions, conclusions and observations have either been confirmed or disproved, all of which constitutes progress in laryngology.

AIDS IN DIAGNOSES

According to Dean[2], cytological examination of the nasal discharge is an important procedure in every patient with a nasal lesion and only slightly less important in ear conditions. Most cases with marked nasal eosinophilia have proved to be allergic. Smears from the nose should be taken through a double glass sleeve, and fluid from the sinuses should be removed by aspiration. X-ray pictures of the maxillary sinuses are often misleading, and no operation on the sinuses should be performed as a result of x-ray examination only. The writer has not yet discovered a discharge from the ear with many eosinophils. The presence of cholesterol crystals and fatty degenerated epithelial cells makes the diagnosis of cholesteatoma positive. In certain blood dyscrasias, with the earlier symptoms referred to the nose and throat, a proper differential count of the blood may make the diagnosis. When myelocytes are found in the course of an infection the condition must always be considered seriously and the time to operate may be decidedly influenced by a differential count of the blood. Blood cultures and cultures of the spinal fluid are often indicated. In tuberculous lesions, the Schilling differential count of the blood, together with the subcutaneous tuberculin test, is invaluable. When acid-fast organisms resembling tubercle bacilli are found in an ear discharge, guinea-pig injections should be resorted to. The Kahn precipitation test and Wassermann test should be routine measures. The surgeon should examine the material secured at biopsy with the pathologist, and give him the benefit of his clinical knowledge.

EXPERIMENTAL WORK

By experimental work, Hilding[3] found that, increasing the flow of air through one nostril by closing the other surgically, caused a structural change in the columnar epithelium proportional to the impact of cold air. In the dog, the epithelium assumed a form much like that of true squamous epithelium. In the rabbit, it lost its cilia and became stratified. The sub-

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epithelial tissues tended to increase in thickness. Similar, but less marked, changes occurred in the less exposed areas. There were marked changes on the closed side also in the rabbit. Ciliated cells decreased in number or disappeared entirely, and mucin-filled cells, which appeared identical with goblet cells, increased. This change appeared to be proportional to exposure to the impact of air, before closure of the nostril. The change was most marked where the epithelium had formerly been most exposed. The turbinates on the open side hypertrophied greatly as compared with those on the closed side, in both dog and rabbit. The mucous membrane of the frontal sinus of the dog underwent marked changes when exposed to the atmosphere. These were characterized by an increase in the thickness of the membrane, an increase in the number of glands and definite changes in the epithelium. The length of the cuboidal cells in the best sheltered regions increased until the cells were of a fairly tall columnar type. In the more exposed regions, the epithelium became of a stratified, nonciliated form.

From experimental work to determine the effect of silver nitrate on the nasal mucosa, Lillie and Childrey[4] found that, following its application on the nasal mucosa of rabbits, the epithelium begins to regenerate as early as one week after treatment, and cilia may appear three months afterward. This epithelium does not appear normal, but is pseudo-stratified and contains an abnormal number of goblet cells. The underlying tissue is fibrous and thick, and, although it contains glands which have apparently regenerated, it is not normal in appearance, but is characterized by marked cellular infiltration. Perhaps of greater importance in connection with the study of vasomotor rhinitis is the fact that the nerve fibers show cellular infiltration and vacuolization. These changes in the nerve fibers may explain the beneficial results obtained in the treatment of vasomotor rhinitis by the topical application of silver nitrate solution to the membranes in the region of the nasal ganglion.

Nemours[5], experimenting on rabbits, finds that stimulation of the parasympathetic system with pilocarpine causes an infiltration of eosinophil cells into the maxillary sinus mucosa of the rabbit.

Trauma also causes the appearance of eosinophil cells into the mucous membrane, either due to stimulation of the vagus endings, or due to special changes taking place in the clotting of blood within the body, as pointed out by Liebreich.

From experimental work with rabbits, Stark[6] comes to the conclusion that so far as the nasal secretions are concerned, there is no apparent ill effect from the repeated use of mineral oil solutions of ephedrine in the nose, other than the reduction of the amount of mucus secreted.

From experimental investigation, Cody[7] comes to the conclusion that vitamin A is necessary to maintain the nutrition of the nasal, aural and tracheal epithelia. The nasal mucosa is affected before and recovers after the ocular. Eventually, the metaplastic and inflammatory changes of the deficiency are cured by a normal diet. Prophylactically, it seems to increase the resistance to upper respiratory infection in children. Therapeutically, its chief value is to improve the nutrition of nasal and aural mucous membranes in acute and chronic infections. While this avitaminosis may be an etiological factor in an atrophic rhinitis, further investigation is required before deciding its status.

Vitamin D deficient diet has no effect on the nasal, aural, and tracheal mucosa. It produces no lesion in the osseous labyrinth in the rat, which resembles otosclerosis in the human being.

Vitamin B deficiency is identified with a definite nasal syndrome. This consists essentially of a postnasal mucous discharge and smooth, moist, creamy-white, and slightly thickened posterior tips of the middle turbinates.

Vitamin G deficiency has no effect on the ear, nose or throat.

ALLERGY

Johnson and Goldstein's[8] series of thirty-four cases is composed of patients who consulted a rhinologist because of symptoms referable to the nose or eyes and who from the history or examination, including the cytologic study of nasal smears, were suspected of being allergic. The ages of the patients in the series varied from two to fifty-five years. The ratio between male and female patients was about equal. The inhalants were the most common offenders. No one food stood out conspicuously in the results of testing. The most frequent symptom was obstruction to nasal breathing, due to nasal congestion, accompanied by a watery nasal discharge. Sneezing was the next in frequency. Seasonal variation was found in six cases. In the remaining cases, the symptoms were referable to the nose the year round. Exacerbations on exposure to dust were marked. Seven patients had other conditions suggestive of an allergic cause, such as eczema, asthma, migraine or spastic colitis. Contrary to the statement usually made that allergic patients show a pale and waterlogged nasal mucosa, the authors found that the color varied from a pale pink to a deeply injected red. In cases in which the symptoms had been present over a period of months, the picture of the pale and boggy mucosa was found. Polypi were found in five cases. In only a few cases was a dark frontal or maxillary sinus found on transillumination. The percentage of eosinophils found on examination of the slides varied from five to one hundred. The

authors found that the count often varied within twenty-four hours. This may be due to an actual difference in the percentage of the various types of cells present or to the fact that only 100 cells were counted. The cells tend to lie in groups of from three to ten or more, and the field examined may not be a true index of the total number present.

In an effort to evaluate the work of Jarvis, who expresses the opinion that the color of the mucous membrane of the nasal septum is an index of the acid base balance of the body—pale septums being present in states of alkalosis, red septums only in acidosis, Bernheimer and Cohn[9] investigated the hydrogen ion concentration of 100 normal and 20 diseased patients.

From this study they conclude that no correlation could be found between the color of the nasal mucosa and the clinical symptoms of acidosis in fifty critically ill patients, all of whom showed clinical symptoms of acidosis with hyperpnea, dehydration and acetonuria.

In 100 normal subjects and in 20 patients with various diseases but with normal hydrogen ion concentration of the blood, there were found all three types of septal mucosa, pale, normal pink and scarlet red.

The color of the nasal septal mucosa was found to be influenced by age, atmospheric condition, type of complexion and other nonpathologic conditions, as well as by alcoholism and body temperature.

The use of diets high in foods producing alkaline or acid metabolic products, together with the adjunct acid or alkaline drug treatment, failed to influence the symptoms or conditions whether in a group of patients suffering from allergic nasal or respiratory disease or in a group with malaise or insomnia. In neither group did the diet affect the color of the mucosa of the nasal septum.

In order to study the effect of radiation on the allergic nasal mucous membrane, forty patients with hyperesthetic rhinitis were irradiated by Bernheimer and Cutler[10]. All the patients treated gave a typical history of spasmodic attacks of sneezing followed by profuse watery discharge and nasal block, the symptoms occurring without relationship to season or climate. Eleven of these persons had demonstrated sensitization to one or more foods or inhalants and none had responded to allergic therapy. Twenty-nine of the forty patients irradiated had previously submitted to some form of intranasal surgical intervention. No patient was irradiated in the presence of polypi or secondary nasal infection.

The treatment consisted of introducing 50 mg. of radium into each nasal chamber and allowing it to remain in place for the total of 200 mg. hours.

In this series of 40 patients, these observers report that there were none who were not benefited, but as only six months has elapsed since this treatment, they are not prepared to evaluate their end results.

After a period of one year, Bernheimer and Cutler[11] gave a further report on these forty patients.

Fifty-two per cent of the patients were symptom-free after one year. Twenty per cent no longer had nasal block or watery discharge, so that while sneezing still persisted in a moderate degree, from the standpoint of the patient's comfort the clinical result was excellent; eight per cent were moderately comfortable, their breathing space remaining unimpaired, although sneezing and discharge persisted; ten per cent received but little benefit and ten per cent were not benefited.

The use of sclerosing injections in the treatment of varicose veins also finds an application in the treatment of congestive rhinitis according to Bruker[12]. The solution employed is 80 per cent neutral glycerine in distilled water, put up in three c.cm. ampoules. The injection is carried out through a wide bore needle fitted into a Luer syringe. After local anesthesia of the inferior turbinate, the liquid is slowly injected deeply into the mucous membrane from behind forwards. Some pain is produced which lasts a few seconds. This can, however, be avoided by a preliminary injection of novocain or by the use of a more dilute solution of glycerine, 50 or 60 per cent. Following the injection, the nasal fossa is lightly plugged with ribbon gauze partly to seal the puncture opening made by the wide bore needle, and partly to arrest hemorrhage. When the operation is completed, the lining membrane of the turbinate looks pale and edematous and there will be some temporary hydrorrhea and nasal obstruction. The injection should be repeated between the third and fifth days as the first injection produces only a sensitization of the tissues. As this sensitization takes some time to establish itself, there should always be an interval of one to six days between the injections.

Walsh[13] has been treating vasomotor rhinitis by the injection of alcohol into the sphenopalatine ganglion.

In a series of 90 patients so treated, his results were nine per cent failures, 30 per cent were symptom-free from one to six months; 31 per cent from six to twelve months and 30 per cent for more than a year.

Hansel[14] and Baum[15] also write on allergy in relation to nasal and sinus disease.

SINUS COMPLICATIONS

From an analysis of seven cases of osteomyelitis of the frontal bone complicating frontal sinusitis, Mosher and Judd[16] conclude that in osteomyelitis complicating infection of the fron-

tal sinus, edema of the skin and soft tissues of the forehead is the first sign of infection of the medulla of the bone and of the periosteum. The infection of the myeloid tissue of the bone and of the periosteum occur at the same time, and advance together. The edema of the skin of the forehead is a practical guide to the extent of bone to be removed. This has been proved by the microscopical examination of bone specimens removed at operation. In operating, two large triangular skin flaps give the best exposure and the best drainage. The bone removal should begin beyond the edema, generally at or near the hairline, and be carried downward from normal bone to diseased bone. The x-ray does not give positive findings until necrosis occurs, and therefore is not positive until seven to ten days after the edema has shown infection of the medulla. When the x-ray finally is positive, the infection of the medulla of the bone has extended from an inch to two inches beyond the necrotic area. Radical operation, multiple radical operations if necessary, offers the best chance of success.

These conclusions may be summarized as follows: Operate early and thoroughly; that is, radically. Don't waste a week waiting for a positive x-ray. Begin the removal of bone above the edema. Work down, not up; that is, from normal bone to diseased bone. Remember that osteomyelitis writes across the patient's brow not only the diagnosis but the treatment. Let the surgeon carry out this treatment. He will then get his best results.

Campbell[17] states that a report of a rather small number of cases, in which acute sinusitis was found in practically 100 per cent of the cases of acute otitis media, does not necessarily prove that all cases of otitis are secondary to sinusitis, but it at least suggests the common association of the two conditions. Furthermore, it suggests that in cases of otitis media the treatment should not be confined to the ear but should be largely directed to the elimination of the sinus infection. This can probably be done best by the frequent and thorough removal of the secretions, little stress being placed on the use of antiseptics. The results of this study further emphasize the importance of considering more seriously infection of the sinuses as a contributing factor in gastro-intestinal conditions as well as in many other disorders of infancy. It is to be hoped that, with the realization of the frequency of sinus infection in infants and children and the direct and remote complications which ensue therefrom, more adequate prophylactic and therapeutic measures may be discovered to combat such conditions.

MUCOUS MEMBRANE

In a symposium on nasal mucous membrane before the American Academy of Ophthalmology and Otolaryngology, Schall[18] presented the histology and pathology of nasal and sinus mucous membrane.

Ross[19] reported upon his work at the Massachusetts Eye and Ear Infirmary, of the study of nasal mucous membrane in hanging-drop tissue cultures.

He contributes to the technic of the method by adding a saline extract of fresh umbilical cord to the culture.

He summarized:

Tissue cultures offer a valuable means for the study of the behavior and reactions of the various cellular constitutents of nasal mucous membrane, and doubtless the solutions of many of the problems relating to the membrane as a whole will be found in the study of these cells in their living state.

Approximately three hundred cultures of nasal mucous membrane were studied, and of the various tissues used nasal polypi gave the most satisfactory results.

In the cultures the cells migrate in the same order as in an inflammatory or traumatic process.

The development of cilia and the formation of goblet cells were not satisfactorily demonstrated. In regard to the latter my observations lead me to feel that the goblet cell is a degenerative process resulting from some chemical alteration of the mucosa, rather than an elective form of the epithelial cell with a secretory function.

In cultures containing bacteria the histiocytes show a marked phagocytosis, whereas the epithelium has a definite resistance to bacteria; these phenomena persisting long after death of the cultures.

My observations lead me to the opinion that the epithelial cell is the first and chief line of defense of the nasal mucous membrane, and that after this defense is destroyed or removed there is little in the secondary defense of the tissues of the stroma that is limited to nasal mucous membrane.

From experimental study, Fenton and Larsell[20], conclude that subject to further experimental confirmation on human subjects, it would seem that the local use of solutions or suspensions of alkaline earth salts or hydroxides (calcium, magnesium) favors the mobilization of histiocytes in acute inflammation. Oily and colloid substances are destructive of epithelium and favor infection by impairing ciliary action, necessitating invasion of the subepithelial stroma by polymorphonuclear cells without any increase in the number of histiocytes. The chlorides seem to favor edematous changes with marked increase of lymphocytes. An increase of plasma cells seems to accompany long-standing fibrous changes.

McGregor[21] and Knowlton[22] present a paper embodying further proof of experimental work done on the maxillary sinus of dogs in which they found that after removal of the sinus mucous membrane, in many cases it was reformed by a mucous membrane that was apparently normal.

MENINGITIS FROM THE SPHENOID

In an excellent paper Eagleton[23] discusses meningitis in relation to pathological conditions of the sphenoid.

Eagleton draws his conclusions from a series of one hundred and twelve postmortems of meningitis. He states that

(1) When pneumococcic meningitis follows a cold in the head, the sphenoid should be suspected of being the primary focus of the meningitis, provided, of course, that no other infection, such as pneumococcic otitis or a pneumonia, was present prior to the original headache.

(2) The presence of a positive blood culture in a pneumococcic meningitis without thrombophlebitis of one of the large venous sinuses adjacent to the ear should awaken the suspicion that the sphenoid may be the primary focus of infection.

(3) Pneumococci have a selective affinity for damaged cerebral tissues and for the blood vessels of the choroid plexus and the ependyma.

(4) In meningitis with streptococcus blood infection without venous sinus thrombosis there is apt to be present a suppurative focus in a medullary bone adjacent to the meninges. This is frequently the petrous apex where it abuts into the sphenoid.

(5) In meningitis of blood stream origin from suppuration of the sphenoid, the temporal bone connected with the ear opposite to the discharging or paining ear is often more seriously affected than the side which is discharging or which has caused pain.

Carotid ligation possibly acts by the control of venous stasis of the cortical and ventricular veins which is an outstanding postmortem finding in all cases dying of subacute meningitis.

ELECTROCOAGULATION

Skillern[24] considers electrocoagulation a method of removing the tonsils that every laryngologist should master, as he will find it is necessary occasionally to remove them by this procedure. It should be spoken of not as the operation of choice but as the operation of necessity. It is the most difficult and dangerous method in the hands of the inexperienced. The dangers and difficulties are multiple in ratio to the lack of knowledge, and no one who is not capable of removing tonsils by other surgical technics and of meeting all complications that may arise during or after the operation should attempt their removal by electrocoagulation. For the average individual, electrocoagulation with its multiple applications of the needle cannot be mentioned in the same category with that of a clean surgical tonsillectomy by a trained operator.

Barlow[25] believes that electrocoagulation is an essential part of physical therapy. The technic of electrocoagulation tonsillectomy, in his opinion, requires more care, judgment and dexterity than the approved methods of surgery. Many men of national repute have tried the method and, after a week or two, have discarded it and become confirmed antagonists. The stumbling blocks and pitfalls in electrocoagulation are the apparent simplicity of the method, the alluring talk of some salesman encouraging any one to buy a machine and use the method, the necessity of developing a technic on private patients without competent instruction, the tendency to hurry and coagulate too large an area at each treatment, the possibility of coagulating into the muscle and having severe pain after treatment, the use of too much local anesthetic and the possibility of causing a flare-up of old quinsy by not allowing sufficient time to elapse after an attack of tonsillitis.

LINGUAL GOITER

Miller[26] and Ziegelman[27], each present a case of lingual goiter, both of which were treated successfully by operation.

NECK INFECTIONS

Beck[28] discusses the analysis of twenty-four cases of neck infection and according to location he divides them into—pharyngomaxillary space infection, submaxillary space infection, carotid sheath infection, cervical gland abscesses, prevertebral fascia infection, buccopharyngeal, visceral or pretracheal fascia infection.

As a surgical approach to these regions he recommends:

Prevertebral fascia infection or retropharyngeal abscess:

(a) Direct incision of the pharyngeal wall through the mouth.

(b) Incision along the anterior border of sternomastoid muscle lateral to the larynx as recommended by Dean.

Pharyngomaxillary, parotid and submaxillary space infection:

(a) Approach through submaxillary space after elevating the gland as recommended by Dr. Mosher.

(b) Approach beneath angle of jaw directly without elevating the gland.

Carotid sheath and visceral fascia infection. Incision along anterior border of sternomastoid muscle as for jugular resection.

Posterior triangle infection. Incision along or behind the posterior border of sternomastoid muscle.

THE LARYNX

From a study of 217 cases of paralysis of the vocal cords, New and Childrey[29] discuss the various pathological lesions causing the paralysis. The paper is a very thorough discussion of the pathology causing these lesions.

From their study they conclude that usually paralyzed vocal cords in the cadaveric position change from this position to the median line within a few months, with return of the voice. If the condition is bilateral, dyspnea develops as the voice improves.

Vocal cords in the median line may return to complete function, but most of them remain in the median line. None of the vocal cords observed in the median line change to the cadaveric position.

Kernan and Schugt[30] report two very interesting cases of submucous laryngeal abscesses. These abscesses occur between the cartilage of the larynx and the mucous membrane causing respiratory difficulty and must be differentiated from edema, syphilis and tuberculous lesions of the larynx.

Inasmuch as this type of case does not respond to simple incision in the pyriform sinuses, their treatment consisted of the external exposure of the thyroid cartilage and a trephine through the cartilage.

Clerf[31] presents a series of twenty-eight cases of cicatricial stenosis of the larynx found unsuitable for direct laryngoscopic dilatation of the larynx. All of the patients had been tracheotomized for relief of dyspnea. In twenty-one, high tracheotomy had been performed; in sixteen there was an atresia of the airway. Of the thirteen cases of postdiphtheritic stenosis, twelve were atresic.

Fifteen cases were treated by laryngostomy, followed by packing the larynx and using various forms of tube dilators.

Thirteen cases were treated by the Schmiegelow method. This treatment consists of transfixing a rubber tube within the lumen of the larynx.

Figi[32] relates the clinical histories of six out of seven cases of chondroma of the larynx, examined in the Mayo Clinic.

Dyspnea and hoarseness are the most common symptoms. In half of the cases, dyspnea was the initial symptom; in the other half, hoarseness. Diagnosis on clinical data alone is seldom justifiable, but a smooth sessile mass, covered with a normal mucous membrane in which the blood vessels stand out prominently is strikingly suggestive of a tumor of this nature.

Displacement and even immobility of a vocal cord may occur. Positive x-ray evidence is of considerable importance, but pictures taken for this purpose must have a very short exposure to be of value.

Treatment depends on the situation and size of the tumor, and may vary from local removal, without opening the larynx, to laryngectomy, but adherence to a conservative policy is advocated, for if the tumor with its capsule is cleanly removed, recurrence should not take place. Radium is of apparent value.

In a beautifully illustrated paper, Orton[33] writes of his experience with the single stage laryngectomy. His operative technic is admirably illustrated. Of thirty-two consecutive cases of laryngectomy the mortality rate from the operation was nine and three-eighths per cent.

Loré[34] writes a most thorough paper on laryngofissure and it is recommended to all doing this type of work.

In order to facilitate the more thorough inspection of the interior of the larynx, Loré suggests the extending of the ventricle incision as a "Y" through the thyro-hyoid membrane without a corresponding incision of the skin. This permits the larynx to be more easily spread and retracted. He also advocates a preliminary tracheotomy through a separate incision as an added margin of safety.

DIPHTHERIA

An interesting article based on the study of 285 cases of nasal diphtheria treated at an Isolation Hospital in Moscow is presented by Gezeld[35]. The majority of the patients were infants and young children. The pathology of this condition is discussed in great detail with histological illustrations. There are full descriptions of the lesions found in fatal cases with directions of the postmortem technic to be followed.

The cases are divided into the fibrinous form (firm continuous membrane) 43.3 per cent, the erosion-type (membranous exudate in small scattered areas) 32.4 per cent, the catarrhal-type (no membrane) which is again subdivided into moist catarrh 14 per cent and dry catarrh 10.3 per cent.

Many cases are examples of mixed infections, e.g., K.L.B. streptococci or staphylococci, or the diphtheritic process complicates scarlet fever or measles, or all these three infections may appear together.

Foreign bodies in the nose are said to be a very rare finding in connection with the K.L.B. infection (four cases).

The main line of treatment remains the diphtheria antitoxin. Nasal diphtheria is characterized clinically by a great chronicity of the inflammatory process, a rapid cure seldom being

obtained. Therefore the best way is to give the antitoxic serum in small and frequently repeated doses so as to raise the resistance gradually. One can use various antiseptic ointments locally. In obstinate cases with tough membrane the author recommends insufflations of boracic powder into the nasal cavities.

LEPROSY OF THE EAR, NOSE AND THROAT

Pinkerton's[36] paper is based on the study of over two hundred cases of leprosy of the ear, nose and throat.

According to Pinkerton the finding of the granuloma of the ear, nose and throat is a very valuable aid in the early diagnosis of leprosy.

He confirms the findings of other workers in that the nose is a very common site of the leprous lesion and that it sometimes exists before clinical lesions have manifested themselves elsewhere.

Bacteriologically, positive nasal findings were shown in from 87-90 per cent of the group studied.

Pinkerton emphasizes the necessity of repeating bacteriological examinations and he examines the serum which is actually expressed from the mucous membrane by a blunt steel dissecting elevator.

Nasal secretions are not examined, nor are swabs used except to clean away crusts and débris but, when the field is clear, firm but gentle pressure is applied just behind the mucocutaneous juncture on the septum, the dissector moving upward slightly, and in this way some of the epithelium may be removed, which, when seen under a microscope, aids in identifying the part scraped and indicates that the technic was carried out in the required manner. Emphasis is placed on the technic in order that one may be sure that the positive findings come from within the tissue itself and are not other acid-fast organisms in the nasal secretions.

In Hawaii, so much do they depend upon the nasal examination that no patient is recommended for release as having a quiescent case until his nasal "snippings" have been bacteriologically negative for a period of three months, or even longer, even though the disease is otherwise clinically inactive before the nasal investigation is begun.

MALIGNANT DISEASE

Beck and Guttman[37] call the attention of the otologist to two relatively newly described types of neoplasms of the nasopharynx, lympho-epithelioma and transitional cell carcinoma.

These growths are characterized by a unique histology, a small and frequently undetectable primary lesion, early cervical metastasis and pronounced radiosensitivity.

The biological properties of these neoplasms contraindicate surgical intervention, while their radiosensitivity renders them especially suited for treatment by irradiation.

New and Harper[38] present a case of plasma cell myeloma of the pharynx, which, contrary to what is usual, did not show bony metastasis.

In a review of 624 cases out of 1,393, seen at the Mayo Clinic over a period of fourteen years and examined microscopically, New and Childrey[39] found that the most common highly malignant tumors of the nasopharynx, pharynx, and base of the tongue are the lymphosarcomata and the highly malignant epitheliomata. The latter are often wrongly described as "endotheliomata" and "branchiogenetic carcinomata".

Of these 624 cases, high-grade squamous-cell carcinomata were seven times as common as the lymphosarcomata; about 50 per cent of those graded "four", occurred in the nasopharynx, while tumors graded "three" were more often primary in the tongue and in the hypopharynx. Eighty-four and two-tenths per cent of the patients were males, the average age being 52 years. A few cases occurred under the age of 20 years; the youngest patient in this series was aged three years.

Symptoms and signs vary considerably, particularly in the nasopharynx, where they may be referred to the nose, eye, ear, throat, tongue, head or face. Just over 24 per cent of the patients observed enlargement of the cervical lymph glands as the first sign, while on examination, 71 per cent showed glandular involvements. In almost one-third of the tumors of the nasopharynx one or more cranial nerves were involved, and an almost similar percentage of cases of the hypopharynx showed paralysis of the vocal cords.

The differential diagnosis is frequently difficult and biopsy is nearly always indicated.

The patients were, for the most part, treated by irradiation, but in selected cases this was supplemented by surgical procedures combined, when necessary, with the use of diathermy and cautery.

A total of 182 cases were treated; of these, 40.3 per cent were alive after an average of 43.1 months, nineteen (10.8 per cent) living 19.9 months, and 16.3 per cent being alive at the end of three years or more after treatment.

All patients treated averaged 34.5 months of life after examination, while those not treated averaged only 6.8 months after examination. Almost all the deaths (96 per cent) were due to the malignant process, most of them being due to the local disease rather than to distant metastasis.

Lund[40] studied the end results as compared with the pathological index of carcinoma of the buccal mucosa made by two observers. Although the classification differed there was definite value in both.

Proportionately, carcinoma of the tongue showed a higher index of malignancy than carcinoma elsewhere in the mouth. The results of

treatment were equal in cases of a given index irrespective of location except for carcinoma of the lip.

The importance of the pathological index of malignancy as one factor to be considered in the complete study of carcinoma of the mouth is reaffirmed.

In a study of 1570 cases of carcinoma of the mouth, Lund[41] finds the evidence of syphilis in 7.8 per cent. He concludes that the differential diagnosis of syphilis of the mouth, carcinoma of the mouth, and combined syphilis and carcinoma of the mouth is difficult and can only be made surely by pathological examination.

In this cancer clinic, cancer of the mouth was found twelve times more frequently in patients with evidence of syphilis or positive Wassermann reactions than purely syphilitic lesions of the mouth were found in such patients.

Syphilis is definitely an etiological agent contributing to the cause of cancer of the tongue in a large number of cases (about one-quarter), but it is a much less important etiological agent in cancer of all other parts of the mouth.

One-half of the patients with cancer and syphilis were treated for weeks or months for syphilis before coming to the clinic. Patients with syphilis and cancer of the tongue whose lesions were studied to determine the pathological index of malignancy showed a higher proportion of patients with very malignant tumors than patients without syphilis. Statistical chance and these two factors working alone or in any combination can account for the apparently poor results seen in the treatment of these cases in this series.

Although the literature should be re-classified, twenty-four different varieties of benign tumors have been recognized by Chevalier Jackson and Chevalier L. Jackson[42]. Histologically these growths showed no invading qualities and the clinical course supported the diagnosis of a non-malignant tumor. Any inflammatory condition in the bronchus may be associated with a tumor-like nodule, although growths may occur without conclusive evidence of infection. These growths may be sessile or pedunculated, and may be covered with apparently normal mucous membrane. Ulceration in the inflammatory type seems rare compared with true neoplasms. The usual symptoms are cough, mucoid expectoration, temperature, wheezing heard at the mouth and hemoptysis. The secondary effects of bronchial growths are almost always serious; they include dilation of the bronchus, obstructive atelectasis, bronchiectasis, abscess and, occasionally, empyema. The diagnosis is arrived at from the physical signs, x-ray, and bronchoscopic biopsy. All kinds of benign growths are easily removed by bronchoscopic means under local anesthesia. Some of these growths, especially papillomata, are prone to recur and repeated removals are necessary. Reëxamination within a few weeks of the removal of the benign growth is advisable. Five cases are reported in considerable detail.

The article occupies eleven columns, is illustrated and has a bibliography.

Clerf and Crawford[43] plead for the early diagnosis of carcinoma of the larynx by a careful laryngoscopic examination and biopsy.

They point out, contrary to the belief of some, that biopsy, followed by early operation in carcinoma of the larynx has not, in their experiences, disseminated metastasis.

Tucker[44], Schall[45] and Graham[46] also present articles on carcinoma of the larynx.

THE ESOPHAGUS

Ireland[47] has been studying the glands of the esophagus in an attempt to explain reported biopsy findings of the gastric mucosa associated with ulceration of the esophagus. From this study he does not believe that true gastric mucosa is ever present in the esophagus. In many cases confusion has arisen from calling the normal superficial glands gastric mucosa. There may occur actual ulceration ingrafted on one of these glandular areas due to the accessibility of their erosions in a lumen that is ordinarily well protected by stratified squamous epithelium.

Infection of the glands is relatively common, especially of the superficial type and may range from a chronic to an acute type of ulceration or abscess formation.

Cells staining with eosin and similar in appearance to serous glands are found. These are not serous glands but inactive cells emptied of mucus.

Cystic dilatation to a minor degree of the ducts of both the superficial and deep glands, is found with no apparent cause. It is frequently associated with a surrounding small-celled infiltration.

Large cysts due to obstruction of the ducts are found. These show a down growth of squamous epithelium similar to that found in Paget's disease of the breast which is a precancerous lesion. These cysts are seen in the gross.

Four cases of adenocarcinoma were all at the transition of the cardiac and deep glands.

Islands of cardiac or superficial glands in the upper end of the esophagus must be considered as a possible origin of webs.

Minor changes occur in the glands such as degeneration, in chronic degenerative diseases, and edema analogous with the cloudy swelling in toxic diseases.

Glands may be anomalous in position—burrowing into the muscle layers.

From a study of three cases of esophageal stenosis in which ulceration of the stomach and duodenum was found, Jackson[48] suggests that the esophagus be carefully studied in all cases

of suspected gastric and duodenal ulcer. In some cases, fluoroscopy may be sufficient, but in most it would be well to make an esophagoscopic examination also.

That patients with symptoms referable to the esophagus be thoroughly studied from a gastroenterologic point of view, both by the roentgenologist and the gastro-enterologist, in order to determine whether there is any co-existing lesion in the stomach or duodenum.

MacMillan[49] defines a diverticulum as a blind pouch which develops from a viscus or canal, and which may consist of one or more layers of the part involved. In studying a series of a thousand patients complaining of dysphagia, he found that eighteen had a Zenker pulsion diverticulum of the pharynx and five had esophageal pouches. None of the patients gave a history of foreign body. In the pharyngeal group the ages varied from eight months to six years and all had regurgitation of unchanged food. Other symptoms varied according to the size of the pouch. The most reliable means of diagnosis was x-ray with barium paste. The sharply circumscribed lower border and spilling over of barium from the upper level of the sac was considered absolutely characteristic. The only treatment used was surgical removal by a two-stage operation.

In the esophageal cases, one was in the upper third, and four in the middle third. Three of these cases complained of substernal distress, pain and dysphagia. Treatment of these cases is difficult but is not often necessary.

Heatly and Pearce[50] present a paper in which four types of perforation of the cervical esophagus are recognized. In the first, perforation occurs slowly by erosion, as from sharp particles of bone which have been lodged for several days. The infection is commonly walled off and not infrequently drains spontaneously at the time of removal of the foreign body.

The second type is described as "the minute type", as in the case of pins or needles. The progress of infection is insidious and a small abscess forms, which may evacuate itself spontaneously or may suddenly invade the mediastinum.

A third type is perforation of the posterior wall, with immediate infection of the retrovisceral space, and spread to the mediastinum.

The fourth type may be considered gross, immediate perforation, such as might result from a false passage during instrumentation, or removal of a sharp foreign body. Symptoms are pronounced and serious, shock is marked, emphysema develops with astonishing rapidity.

The following indications for external drainage are submitted:

1. Cases presenting definite evidence of localized abscess in the neck.
2. All cases in which gross perforation is known to have occurred as the result of faulty instrumentation.
3. Cases presenting x-ray evidence of a foreign body outside the lumen in the periesophageal tissues.
4. Cases in which perforation of the posterior esophageal wall can be established by endoscopic or x-ray study.
5. Cases presenting emphysema in association with rising fever and leucocytosis.
6. Any case when, in the presence of a known or suspected perforation, any reasonable doubt arises as to the safety of the patient.

Briefly, the operation advised is an exposure of the esophagus at a level of the lower third of the sternomastoid muscle. The thyroid is retracted medially and the space between the esophagus and the prevertebral fascia is opened up, and packed with gauze.

The paper is well illustrated and a series of eight cases are described.

Iglauer[51] points out that retrograde esophagoscopy in cases of impermeable stricture is not always easy to accomplish, as the gastrostomy may be poorly placed and folds of the gastric mucous membrane may get in the way. In such cases, the use of the cystoscope is advised, not only to pass a catheter up the esophagus, but also in order that lesions of the stomach itself, such as lye burns, may be demonstrated.

A case is described in which the passage of a ureteric catheter was sufficient to relieve the structure, after which dilatation proved comparatively easy.

Following this, the method was used in three other cases, aged four, three, and two years and, in all of these, the catheter was passed into the pharynx with great ease.

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A FATAL CASE OF AMOEBIC DYSENTERY. Preliminary Report*

BY DAVID D. SCANNELL, M.D.†

CASE HISTORY:

J. K. Aged 42, chauffeur. Admitted, November 11, 1933. Referred by Dr. S. F. Curran.

For seven weeks had had periods of diarrhea with nausea, but no vomiting. There were attacks of pain in the midabdomen. None of the symptoms had any relation to meals. There was progressive weakness and loss of 30 lbs. in weight. The loss of weight began before any other symptoms. Examination was negative except for evidence of loss of weight and tenderness in the epigastrium. The patient was not confined to bed. X-ray examination of the gall bladder showed faint filling with the dye. Barium enema on November 19 was reported as follows: "Enema passed to cecum without delay. At the midportion of the transverse colon there was an irregular filling defect one cm. in length. The cecum contained considerable amounts of fecal material." Diagnosis: "Probable carcinoma of transverse colon."

On this diagnosis, operation was performed on November 24. Under ether anesthesia an incision was made in the midepigastrium. On the anterior surface of the transverse colon there presented a hard, slightly nodular mass that involved the whole periphery of the bowel. The mass was freely movable. Directly under it were two glands, one and one-half and one-half cm. in diameter, respectively. A resection of the mass and glands was done, followed by a double colostomy (Mikulicz operation). Inspection of the mass at operation and in the gross after its removal left no doubt in the mind of the surgeon or the pathologist that the diagnosis was cancer. The first two days postoperatively were comparatively uneventful. On the third morning the clamps were removed and the upper colostomy drained freely. But he did not seem so well. That afternoon the pathologist discovered the amoebas in the walls of the ulcer. Treatment with emetin was begun, but the temperature and pulse rose rapidly in the next twenty-four hours and he died November 28. There was no autopsy.

COMMENT: At the time of the operation the physicians, the patient and his family did not know of the epidemic and did not take it seriously in connection with the symptoms and x-ray findings. After the diagnosis was made it was learned that the man had been to Chicago in September and stayed at the Congress Hotel. *His first attack of diarrhea occurred on the train on the way home.*

The lesson from this case is not to take x-ray findings too definitely, especially when the roentgenologist qualifies his diagnosis as he did in this case. In any case for the present where surgery of the colon is to be undertaken proctoscopy, stool examination for amoebas, blood and other parasites should be made. When there is no urgency in the situation, it is often well to repeat the x-ray examination.

It is expected that a further, fuller report on this case will be made later in conjunction with Dr. Ritvo of the Department of Roentgenology.

*From the Third Surgical Service of the Boston City Hospital.

†Scannell — Senior Surgeon-In-Chief, Boston City Hospital. For record and address of author see "This Week's Issue," page 1179.

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 19491

PRESENTATION OF CASE

DR. NEIL L. P. CRONE*: *First admission:* The patient, a married metal worker of German birth and twenty-three years' residence in New England, first entered the hospital at the age of twenty-eight, nine years before his final admission, with a complaint of fever and cough of four days' duration.

The onset of his illness was of dramatic suddenness, while he was receiving the fourth of a series of intravenous arsphenamin injections. After only a part of the injection had been given he began to feel restless and weak and to cough. A severe pain soon developed in the chest, mostly in the front and precordial regions, which was considerably intensified by respiratory movements. For two hours he coughed incessantly. Adrenalin was given with some relief. Large doses of sodium bicarbonate were followed by vomiting. He was carried home and put to bed. The vomiting ceased but the cough persisted and became productive. On the third day the sputum was rusty. On the fourth day of the illness he was brought to the hospital in an ambulance.

He had had typhoid, scarlet fever and diphtheria in childhood. He had had a penile sore seventeen years before entry, and several attacks of gonorrhea.

Physical examination on entry showed a well developed and nourished, markedly dyspneic man lying flat on his back and complaining of pain in the left chest on inspiration. The pupils were normal in appearance and reaction. Palpable glands could be felt in both axillae and the groins. The heart was normal in size. The sounds were of good quality. No murmurs were heard. The pulses were equal and synchronous, of normal volume and tension. The blood pressure was 120/80. The lungs showed no abnormalities to percussion. The breath sounds were diminished over the front of the left chest. At the left base a small area of intense bronchial breathing was noted, and coarse inspiratory râles were present at both bases. The abdomen showed marked tenderness and spasm in the right upper quadrant. The liver edge, however, was not palpable. The remainder of the abdomen was soft and not tender. The reflexes were normal.

Laboratory examination of the urine showed a specific gravity of 1.012 to 1.030. Three out of five specimens showed the slightest possible trace of albumin. None of the specimens showed sugar, bile or acetone bodies. The sediment showed occasional hyalin and granular casts and a moderate number of white cells. The renal function test was 30 per cent. The blood showed a hemoglobin of 90 per cent, a red cell count of 4,800,000 and a white cell count of 20,000 to 28,000 to 14,000. Five specimens of sputum were free from tubercle bacilli. The stools were negative. The Wassermann was negative.

Course. The tenderness and spasm in the right upper quadrant promptly cleared. A larger area of bronchial breathing appeared at the left base accompanied by a friction rub, and a few days later a friction rub appeared on the right side also. His temperature ran between 101° and 102° for seven days, then dropped slowly over a two week period to normal. The pulse was 100 to 130, dropping to 90. The respirations were 30, dropping to 20. He was delirious on one occasion, three days after entry.

X-ray taken eight days after entry showed coarse irregular mottled dullness throughout both lung fields. The outline of the diaphragm was indistinct on both sides. The appearance was that of extensive bronchopneumonia. On the same day a chest tap on the left yielded 300 cubic centimeters of brownish-red fluid with a gravity of 1.016.

Three weeks later a second x-ray showed the same process throughout the lungs, somewhat less marked than before. It was most prominent in the lower halves of the lungs and in some areas was very dense in character, suggesting that the process was of considerable duration. The root glands were increased in size and density on both sides. It was interpreted as a pneumonic process, but it was thought that tuberculosis must be considered.

Interval history. The patient was seen on two occasions between his first and second admissions to the wards. Eight years after his first entry he was brought to the Emergency Ward in coma. While at work he had suddenly developed blurring of vision, "things went completely black" and he fell down unconscious. Physical examination in the Emergency Ward was essentially negative. Skull plates showed no evidence of fracture. He was discharged after three days apparently well.

A month later he returned to the Male Medical Outpatient Department with a story of attacks of epigastric burning, relieved by food and by yeast cakes. An appointment was made for a gastro-intestinal series but was not kept.

The patient was again lost track of. He entered another hospital nine weeks before his second admission to the Massachusetts General Hos-

*Recently senior interne on the West Medical service.

pital and was discharged after eight weeks. In the interval he had had continuous headaches, vomiting and blurring of vision. For four or five months he had complained of hoarseness. From his wife and son it was learned that he had had a nearly constant, usually productive cough since his attack of pneumonia nine years previously.

Second admission, six months after his last visit to the Outpatient Department.

On physical examination the patient now appeared thin, showing much apparent loss of weight. The forehead was wrinkled. He seemed mentally dull and responded poorly. His memory was poor. Hearing and vision were both diminished. The fundi showed bilateral papilledema, most marked on the right. There were small hemorrhages in the right disk. The veins appeared engorged and there was slight sclerosis of the arteries. The tongue protruded in the midline. Numerous teeth were missing. There was moderate caries. There was no facial asymmetry. There was paralysis of the left vocal cord. No lymph nodes of abnormal size were felt except a right epitrochlear. The chest was long and flattened anteroposteriorly. There was slight dullness along the anterior border of the left axilla. Slight bronchial breathing was heard along the left border of the heart and in the left axilla. The abdomen was held rigid and palpation was unsatisfactory. No masses could be made out. There was a questionable greater degree of stiffness in the left arm and left leg than in the corresponding extremities on the right. The plantar reflexes were possibly extensor, but somewhat equivocal. There was slight limitation of flexion of the neck.

Laboratory examination of urine showed the specific gravity 1.020 to 1.026. Albumin was present in one of three specimens. There was no sugar. The sediment showed rare white cells and occasional hyalin casts. Blood: hemoglobin 80 per cent, red cell count 5,000,000, white cell count 18,600 to 15,500. The Hinton test was negative. A lumbar puncture gave 3 cubic centimeters of clear colorless fluid, initial pressure 370, final pressure 130, pulsations usual; cells, two lymphocytes; ammonium sulphate and alcohol negative.

X-rays: Skull. "Sella turcica is normal in size and shape. Convolutional markings prominent on both sides of skull. Bones of skull otherwise not remarkable. No unusual shadows present." Chest: "There is mottled dullness involving the lower third of the left lung field. Dullness in the lateral view is seen to lie in anterior portion of the chest. It has ill-defined borders. The heart shadow is displaced to the left. Diaphragm on this side is elevated. No fluid levels demonstrated. Upper portion of the left lung and entire right lung field are clear. Dorsal spine is not remarkable except for some atrophy."

A laryngeal consultant confirmed the paralysis of the left arytenoid and vocal cord. There was neither adduction nor abduction on breathing or phonation.

The temperature averaged 101°, the pulse 90, the respirations 20.

The patient was transferred three days after entry to a Surgical service for operation.

Roentgenological Discussion

Dr. Crone: The x-ray interpretation was: "The appearance is consistent with collapse of the lower portion of the left upper lobe, or it could be due to a destructive process within the lung parenchyma. Pressure on a bronchus, foreign body or malignancy would give such a picture. It is also consistent with abscess or other destructive process within the lung."

Dr. George W. Holmes: I will show you the skull films first, although they show nothing of particular interest. The convolutional markings are prominent, but no more than one would expect in a man with heavy bones such as he had. The sella turcica is normal and he has no calcified areas.

In the films of the chest there is a definite lesion in the lower part of the left chest with elevation of the diaphragm on that side, some narrowing of the intercostal spaces and displacement of the heart towards the affected side. In the lateral view it can be seen that the process lies in the midlung field and not in the pleural space between the lobes. We have very good evidence that the process is pulmonary rather than pleural and that it is producing either destruction of the lung or obstruction of the bronchus leading to the involved area.

There is nothing remarkable about the heart shadow.

The spine shows no more change than might be expected in a man of his age.

Unless we can demonstrate a fluid level we cannot say whether a cavity is present or not. I do not know of any way in which we can differentiate between foreign body, new growth or pressure on the bronchus.

Differential Diagnosis

Dr. Walter Bauer: I have been inclined to believe that the initial illness might possibly have been related to his final illness. As you remember, his illness at his first entry was characterized by a dramatic onset, commencing at the time he was receiving his fourth intravenous injection of arsphenamin. He had sudden pain in his chest. I wondered whether or not he might possibly have had multiple pulmonary emboli rather than a bronchopneumonia. Certainly it seems to me a rather strange coincidence that a man should fall ill with bronchopneumonia at the time that he was receiving an injection of arsphenamin.

The fact that the question of syphilis is in-

troduced makes the differential diagnosis more difficult, for me at least. I do not believe there is sufficient evidence to warrant this diagnosis. If the history is correct, he would have been eleven years old at the time of his penile lesion. This would seem very unlikely. Furthermore, there is nothing in the record to intimate that a penile scar had been observed, nor were there any findings on physical examination to indicate that he might have had syphilis. All Wassermann tests were reported negative.

I thought that his first illness was due to multiple pulmonary emboli from improperly mixed arsphenamin. His productive cough supposedly dated back to the time of his so-called "pneumonia". Could this not have been due to a low-grade pulmonary infection or bronchiectasis which had been present ever since his initial illness? I did not think he had tuberculosis.

The record stated that he had a renal function of 30 per cent the first time he was in the hospital. He had a very slight trace of albumin on a few occasions, but nothing else to indicate that he might possibly have had Bright's disease. He had a good specific gravity, a normal red cell count and normal hemoglobin.

I do not know just how to interpret the interval history. The episode for which he was brought to the Emergency Ward in coma might conceivably represent an ordinary syncope with a concussion as a result of his fall. Such an interpretation in the light of subsequent developments seems unlikely. I think that this initial cerebral accident probably was related to his final illness.

The first evidence that all was not well in the chest is the history that four or five months prior to his last admission he complained of hoarseness. It is very likely that he had a paralysis of the left recurrent laryngeal nerve at that time. This finding would seem to indicate that he had a lesion in his mediastinum or lung as long as five or six months prior to his final entry. Such being the case, one might be inclined to believe that the episode for which he was brought to the Emergency Ward might very well have been due to a cerebral embolus.

When he was admitted to the hospital for the last time he showed evidence of marked weight loss, which of course may have been the result of repeated vomiting or malignant disease.

He obviously had symptoms and signs of increased intracranial pressure. As I read the report I thought that the chest findings were consistent with collapse of the lung, as shown by the shift of the heart, the elevated diaphragm and the dull shadow in the left lower lobe.

I think it is fair to say that the neurological examination was essentially negative except for bilateral papilledema and questionable stiffness of his left arm and left leg. The latter finding is the only one that would enable me to locate the intracranial lesion.

The laboratory data at this last admission again showed the Hinton to be negative. The lumbar puncture revealed an increased cerebrospinal fluid pressure. The puncture gave only three cubic centimeters of clear colorless fluid. I do not know whether that was all they could obtain or whether there was some contraindication to removing more. A negative fluid, except for increased pressure, would favor a brain tumor of some sort.

Therefore I was inclined to connect the pulmonary condition with the intracranial lesion and thought that the most reasonable diagnosis was carcinoma of the bronchus with brain metastasis. I further believed that this lesion had occluded his bronchus causing subsequent collapse of this lobe. If he had had a previous pulmonary infection such as bronchiectasis, then one might suspect the presence of a destructive pulmonary process in this collapsed lung.

Further History

Dr. Crone: On the fifth day a left subtemporal decompression was done. The patient was in poor condition both before and after the operation. He grew rapidly worse. One thousand cubic centimeters of 10 per cent glucose was given intravenously. Paraldehyde was necessary to quiet him. He died thirty-eight hours after the operation without recovering consciousness.

Clinical Discussion

Dr. Gerald Blake: This patient's general appearance suggested that he was suffering from malignant disease. I do not know whether that was due to the marked loss of weight or not, but he gave us that impression as we looked at him.

The definite signs were of pathology in the lung and involvement of the central nervous system. Neither by clinical examination nor by x-ray did the lung signs suggest tuberculosis, and we were unable to find evidence of malignant disease elsewhere. Therefore we made a diagnosis of probable primary malignancy of the lung with metastases to the brain and he was transferred to the Neurological Service for further study and operation.

Dr. John S. Hodgson: He was seen by the Neurological Service at the request of the Medical Service because of increased intracranial pressure. There were no localizing signs. The question was whether or not something could be done to give him relief from headache. I was unable to find anything definitely localizing, but there were one or two signs suggesting that the trouble might be in the left cerebrum. We were doubtful of accomplishing much. A left subtemporal decompression was performed in preference to a large bone flap, which would have been done if his condition had permitted. We were able only to relieve the increased intracranial pressure, and exploration simply to the

extent of tapping the ventricle and brain was done under novocain anesthesia. He was semicomatose, went from bad to worse and died within thirty-six hours.

It should be understood in this case that there was considerable doubt as to whether we could or should attempt anything at all, and what was done was with the intention simply of relieving headache rather than of finding any removable pathology.

There was a question of malignancy. It was agreed that it was metastatic rather than primary brain tumor. There was still a question of abscess, but metastatic malignancy was the logical diagnosis, with the lungs as the probable primary focus.

Clinical Diagnoses

Carcinoma of the lung?
Metastases to the brain?
Lung abscess (?) with metastases to the brain?
Left frontal brain tumor?

Anatomic Diagnoses

Carcinoma of the lower lobe of the left lung with metastases to the brain, the kidneys and the retroperitoneal lymph nodes.
Operative wound, left temporal decompression.
Arteriosclerosis, slight.
Chronic fibrous pleuritis, bilateral.

Pathologic Discussion

Dr. Tracy B. Mallory: When one has evidence of a lesion in the lung and simultaneous evidence of a lesion in the brain other than sinus thrombosis one is pretty safe in connecting the two via a process of metastasis from the lung to the brain, although it may equally well prove to be either metastatic malignant disease or a metastatic sepsis.

In this case it was malignancy. There was a very large primary cancer of the left lower lobe, and we found in the brain three separate metastases, which might account for some difficulty in localizing the process. The largest one happened to be on the right, the opposite side from the region Dr. Hodgson had explored, but there were two smaller lesions, one in the left frontal lobe, the other in the left temporoparietal region.

The only other metastases in the body were to the hilus glands and to the kidneys.

The tumor had done one thing that is a little unusual in a primary cancer of the lung. It had actually invaded the pericardium by direct extension. One whole surface of the tumor pressed directly against the heart within the pericardial cavity.

Dr. Holmes: I should like to ask if there was any fluid in the pericardium.

Dr. Mallory: About 300 cubic centimeters—little more than the normal amount.

Dr. Holmes: Of course the shadow of the mass was continuous with the shadow of the heart and we had no way of seeing it, although we might have suspected it.

CASE 19492

Presentation of Case

Dr. Thomas S. Claiborne:* A sixty-four year old American shoe worker entered complaining of pain and gas in the stomach of six weeks' duration.

Five years before admission the patient worked in a shoe factory for about six weeks. During that time he lost twenty-four pounds in weight which he never regained. One week after he started work he began to have sharp cramp-like pains in the epigastrium. He ate breakfast at half-past six a.m. and invariably at nine a.m. the pain would begin. This pain was relieved by eating a cookie and drinking coffee. He would eat lunch at noon and at exactly three o'clock the pain would recur. This was also relieved by food. These attacks continued for five weeks, at which time he stopped working. Two weeks later his pains disappeared. He felt perfectly well and was symptomless until five weeks before admission, when he was working in a hotel where he had been for the summer. On this day he had been working very hard moving cases and ate a hot New England boiled dinner. Two hours later sharp cramp-like pain developed in his epigastrium. Three days later the pain again began to recur at regular intervals, at nine a.m. and three p.m. each day. It was relieved by milk or cream. Three weeks before admission the pain occurred every two hours and was relieved by milk or jelly. Since then he had had abdominal rumblings but no belching or passage of gas by rectum. A physician gave him powders which caused him to vomit. The vomitus expelled at the last spasm was blood stained. He had vomited several times since then, especially after food. Each time the vomitus was blood tinged. He had not vomited however for the past week.

His father and mother and two siblings died of cerebral hemorrhage.

The patient had been married for thirty years. His wife was living and well. There were four children. One died during infancy, one dropped dead at the age of twenty-five; the other two were living and well. For the past four years he had been separated from his wife.

He slept about eight hours each night. He was cheerful, intelligent, quite coöperative and pleasant to work with.

He believed he had had an aborted case of

*Senior interne on the West Medical service.

pneumonia four years before entry. He had asthma at nine years, but had had none since. Nine years before entry his right knee was swollen and hot but was relieved by icebags in one day. Since that time this knee had been somewhat stiff.

Physical examination showed a well developed and somewhat undernourished man in no distress. The skin was clear. The pupils were equal and reacted to light and accommodation. All his teeth were missing. His heart was normal in size. The sounds were distant. The blood pressure was 130/75. There was slight epigastric tenderness. No abdominal masses were felt.

The temperature was 99.8°, the pulse 87, the respiration 23.

On laboratory examination the urine was slightly cloudy. The specific gravity was 1.020. There was no albumin or sugar. The sediment was normal. Examination of the blood showed a red cell count of 4,400,000, a hemoglobin of 100 per cent Tallqvist, a white cell count of 9,750, with 76 per cent polymorphonuclears. The smear was not remarkable. The stools were negative. The Hinton was negative. Gastric analysis showed on fasting 65 cubic centimeters of clear slightly mucoid material, free acid 6, total acid 17; after one hour free acid 13, total acid 27. Guaiac was negative.

A gastro-intestinal series showed just above the midpoint irregularity of the lesser curvature, and there appeared to be a one centimeter ulcer crater with some surrounding induration in this region. The lesser curvature about the lesion was straight and finely irregular in outline.

He was transferred to the Surgical Service.

DR. JAMES R. LINGLEY: As is usually the case, the fluoroscopic observation is a little more important than the films and demonstrates the lesion better.

On the lesser curvature and slightly posterior there was a small projection of barium. There seemed to be some rigidity of the surrounding wall. I could not be sure whether or not it was malignant. It had the appearance of a benign lesion, but in view of the slight rigidity on each side, which suggested induration, I thought it could be either benign or malignant.

The esophagus and duodenum were negative.

Differential Diagnosis

DR. ARTHUR W. ALLEN: This case on first impression seems so clear cut that one wonders where the catch is going to be.

There does not seem to be very much doubt that this man must have had an ulcer five years prior to his admission. His history of pain at such precise intervals after taking food would seem to be perfectly consistent with a peptic ulcer. Interestingly enough, this began during some rather heavy form of work and subsided when he stopped work. It is quite extraordinary that without any diet or without any care apparently, so far as his stomach is concerned, he could go along for practically five years before he had a return of symptoms. The loss of weight at the time of his first episode may be significant. Maybe he was more careful with his diet than his history would lead us to believe, and maybe that is why he had so little trouble all that time. When he came in here there was, judging from his history, recurrence of pain following an indiscretion in diet, if one may be so bold as to call a boiled dinner in New England an indiscretion in diet. That would make one feel that he had a definite recurrence of peptic ulcer. On the other hand he was sixty-four. He did not have a very high acidity. We have a lesion in the stomach which is probably five years old, not in the duodenum, and then we have the roentgenological finding of a good deal of fixation in the region of the lesion. So I think one must very strongly consider the possibility of malignancy in this stomach. From his history, his pain and his tenderness, however, I think one would have to place ulcer first and malignancy second.

Further History

DR. CLAIBORNE: Under ether anesthesia a gastric resection and posterior gastro-enterostomy were performed (Schumaker operation).

His postoperative convalescence was uneventful and he was discharged three weeks after admission.

Diagnosis

Carcinoma of the stomach, probably developing in an ulcer.

Pathologic Discussion

DR. TRACY B. MALLORY: This man was operated upon by Dr. Miller. I am sorry he is not here to tell us his findings and his impression about the case. When he operated he found a lesion on the lesser curvature which was fairly extensive and showed a definite ulcerated crater. The edges were a little bit polypoid but were soft and did not feel definitely malignant. On the other hand there were a number of very much enlarged lymph nodes and one or two of these seemed obviously to be metastatic carcinoma. He asked us to do a frozen section from the edge of the ulcer at the time of operation. We attempted this and could find no evidence of malignancy, though the nodes were positive. We then put through some celloidin sections and confirmed the diagnosis of cancer in the lymph nodes, though again we could not find any definite cancer in the edge of this ulcerated lesion. We then cut about six sections and in two of them we found definite cancer.

This is the final and positive section. This is the serous surface. Over here is the mucosa. There is a fairly extensive gastritis at the

periphery. Then we come to the margin of the sharply punched out ulcer. A large part of that simply shows a little necrotic tissue lying on the deeply ulcerated muscularis. At one corner however one can see epithelial cells which are rather purple in color invading downward in between the glands. With a higher power it is possible to prove that these are definitely epithelial cells of very undifferentiated character and there is no question that there is a focus of malignancy at one edge of this ulcer. We have not been able to find it in any other spot.

When one gets a picture such as this the question always comes up whether one is dealing with cancer from start to finish or whether it is a case of ulcer in which cancer has finally developed. It seems to me that in view of the history and the absolute findings in this case the latter is much more probable here. We have a very large ulcer and a very small area of carcinoma. We have a history that runs back five years with a long period of relative freedom from symptoms between his first and his final admission. I should be inclined to guess that the symptoms of this final admission represent the symptoms of developing cancer.

What is your feeling about it, Dr. Allen?

DR. ALLEN: It is quite unusual to have a carcinoma of the stomach cause a great deal of pain until the lesion has acquired considerable size. Of course we have felt that a great many cancers of the stomach do develop on ulcer, perhaps not all of them, but some we think certainly do.

From the symptomatology which this man presented without the help of x-ray it seems to me that one would feel pretty sure that it was ulcer rather than cancer. He had acid in his stomach, he had tenderness and he had pain which was the type of pain commonly seen in peptic ulcer, with a little blood streaked vomitus now and then. Without having recently lost any weight, and not having a palpable mass, not having an anemia, I think one would consider ulcer very strongly as the probable diagnosis rather than carcinoma.

DR. MALLORY: This man left the hospital after a fairly uneventful convalescence and so far as is known at present is apparently well.

A PHYSICIAN: What was done?

DR. MALLORY: Resection of a fairly large portion of the stomach and the obviously enlarged lymph nodes. On the other hand with a type of tumor as undifferentiated as this, which in spite of the small size had already reached the lymph nodes, it seems to me the chance of further metastasis is great. I do not believe the prognosis is very good.

DR. AUBREY O. HAMPTON: Do you believe that a small carcinomatous nodule in the stomach might ulcerate away almost completely?

DR. MALLORY: It seems to me that it is perfectly possible. One occasionally sees such a picture with a relatively short history and one wonders if it may not have been malignancy from the start and ulcer occurring in the focus of malignancy, which might be relatively less resistant than normal tissue. In the case of a five years' history the probabilities are the other way.

DR. GREENE FITZHUGH: Was he tried on the Sippy régime before operating on him to see what effect it would have on the shape of the lesion?

DR. MALLORY: Not on this occasion.

A PHYSICIAN: Did the portion of the ulcer that showed no cancer show fibrosis?

DR. MALLORY: There was fibrosis out on the serous surface of the stomach. The ulcer itself backed down on the muscularis and the muscular layer was almost perfectly clean, without any induration or any fibrosis in it. It is only when we go beyond the muscularis that fibrosis appears.

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THE CHILD RECOVERY CONFERENCE

THE *Journal*, in a recent editorial (October 26, 1933) commented on the call to arms which Secretary of Labor Frances Perkins had issued on the strength of increasing and ominous reports of the spread of malnutrition among the children of our country. Even before this editorial was published much had transpired. A national committee had already met in Washington and found sufficiently convincing evidence of an increase in malnutrition to justify calling a conference; on October 6 the conference had gathered, consisting of over one hundred and forty representatives from forty-three states, and a ball had been set rolling.

The results of this Conference were first reported in Boston on October 26, at a luncheon meeting under the auspices of the Boston Health League, addressed by three members of the conference, Doctor Richard M. Smith, Doctor M. Luise Diez, Director of the Division of Child Hygiene of the Massachusetts Department of Public Health, and Doctor John Ferrell, of the Rockefeller Foundation. On October 30 Miss Grace Abbott, Chief of the Children's Bureau of the Department of Labor, addressed a similar audience and further clarified the situation.

It is apparent that, despite inadequate standards for the measurement of nutrition, malnutrition is rapidly increasing throughout the country. The type of family in need, moreover, has shown a shift, those on the borderline of organized relief now suffering more than those who are actually receiving aid. One of the most striking studies of the situation has been made in Pennsylvania, under the initiative of Governor Pinchot, where great suffering has been revealed, particularly in the coal mining region, although it is by no means confined to this section. To study further and ameliorate these conditions an organization has already been perfected in Pennsylvania, centering in the State Medical Society, and all but two members of the Society have volunteered their services.

In view of the facts disclosed, the original committee which met in Washington recommended that a study of the actual condition of the children of the country be made, with an effort to establish the location of those who are malnourished, and that machinery be set up to correct conditions in malnutrition and hygiene.

For this the coöperation of all existing public and private agencies is necessary, and an outline of a state and county plan was submitted to the Conference. Whatever else is done, the feeling predominates that relief must not be considered as a temporary emergency measure, but must be accompanied by community education if the work is to meet success. As Doctor Ferrell stated the case, permanent, not temporary agencies must be strengthened and built up, and in dealing with the problems of the day the future goal must be borne in mind.

Miss Abbott, on the later date, spoke to much the same effect. Last winter, evidence of serious malnutrition began first to accumulate from many quarters, state departments of health reporting child nutrition as a pressing problem. As she stated it, the percentages dealing with malnutrition may not be correct, but changes in the percentages are significant. The problem is present, it must be met, and it furnishes a great opportunity for coöperation among existing agencies, for any program should fit in with the regular resources; not replace them. Federal funds, moreover, will be available only for the relief of actual distress, and not for setting up new or strengthening old resources. Food, however, is not the only necessity in such a program; medical correction is needed in many other directions, and the social aspect of child

health must receive its due consideration. We must not come out of this period of distress contented to resume the old standards. If efforts are to be made they must be made with a far-sighted eye to the permanent raising of the level of living. Out of the sad old world a brave new world must be born.

AMOEBIC DYSENTERY

On pages 1171 and 1181 will be found statements from Dr. Scannell and the Massachusetts Department of Public Health in regard to the present status (December 4th) of the amoebic dysentery epidemic as it affects Massachusetts. Every one of the sixteen proved cases that has been reported in the State in the last month has been traced to Chicago and all but two to hotels that are known to have had many carriers among their kitchen employees. A recent report (Nov. 27th) from the Chicago Department of Health states that they have located 324 carriers, that 368 proved cases in 118 cities and towns have been reported with 25 deaths. This report was made in a letter sent before the death in Boston had occurred.

In reiteration of statements made on the editorial page of this *Journal* two weeks ago, the illness of any patient who has been in Chicago this summer must be looked at with this diagnosis in mind. On account of the ease with which whole families become infected one should also look out for illness in any patient in a family from which any one member went to Chicago. On account of the diverse nature of the symptoms, remember that practically any abdominal symptom may be present or absent. Diarrhea is by no means universal and gross blood is frequently absent from the stools. Be on guard in the case of the man who has no abdominal symptoms at all, but merely malaise, with or without chills and fever. He may be suffering from a liver abscess. Take a very careful history and interpret with due scepticism any type of laboratory work for the present at least. Check all laboratory work by frequent repetitions and by using many different procedures, not forgetting to use the proctoscope. Remember that amoebas cannot be demonstrated in a cold stool. Remember, too, that perforation and peritonitis may occur at any moment and that, after a reasonable length of time has been used in trying to arrive at an exact diagnosis, a therapeutic test should be used.

On December 1st a death occurred in the Faulkner Hospital from liver abscess, that was of amoebic origin, in a man who stayed in one of the infected Chicago hotels. An autopsy has been done. This case will be reported in the *Journal* next week by Drs. Ohler and Wood.

THE HOPE OF THE CANCER PATIENT

It should be emphasized in lay publicity articles and personal advice, that cancer is curable in many cases as shown in the report submitted at the October meeting of the American College of Surgeons in Chicago by Dr. Franklin Martin, Director General.

The figures for five year cures for 1932 are 8840 recorded cases, and for 1933, 15,608, or a total for three years of 24,448.

Doctors should have these figures in mind when presented with patients who may have cancer, but emphasis should be expressed on the necessity for early treatment in all cases. There must be no temporizing with cancer which now stands as the second in the causes of death in this country. Most cases of death resulting from malignant growths are due to ignorance, procrastination of the patient, or insufficient study by physicians, and this last of the triad is too often a contributing factor.

THIS WEEK'S ISSUE

Contains articles by the following named authors:

Lord, Frederick T. A.B., M.D. Harvard University Medical School 1900. Visiting Physician, Massachusetts General Hospital, Boston. President, Massachusetts Tuberculosis League. His subject is "The Prevention and Control of Tuberculosis in the Commonwealth of Massachusetts with Special Reference to Institutional Care and Early Diagnosis." Page 1137. Address: 305 Beacon Street, Boston.

Haggart, G. E. A.B., M.D. Harvard University Medical School 1919. Chief of Bone and Joint Service, Lahey Clinic, Boston. His subject is "The Treatment of Comminuted Colles' Fracture in Elderly Patients." Page 1140. Address: 605 Commonwealth Avenue, Boston.

Lund, Charles C. A.B., M.D. Harvard University Medical School 1920. F.A.C.S. Surgeon to the Collis P. Huntington Memorial Hospital. Assistant Visiting Surgeon to the Boston City Hospital. Instructor in Surgery at the Harvard Medical School. His subject is "Second Primary Cancer in Cases of Cancer of the Buccal Mucosa. A Mathematical Study of Susceptibility to Cancer." Page 1144. Address: 319 Longwood Avenue, Boston.

Greenberg, Boris E. M.D. Tufts College Medical School 1918. F.A.C.S. Assistant Urologist, Beth Israel Hospital, Boston. Urologist, Evangeline Booth Hospital, Boston. Consultant Urologist, Essex County Sanatorium, Middleton. Address: 311 Commonwealth Avenue, Boston. Associated with him is

BRODNY, M. LEOPOLD. M.D. Tufts College Medical School 1928. Assistant Urologist, Outpatient Department, Beth Israel Hospital, Boston. Address: 371 Commonwealth Avenue, Boston. Their subject is "Methylene Blue in the Treatment of Urinary Tuberculosis." Page 1153.

MACOMBER, DONALD. A.B., M.D. Harvard University Medical School 1909. F.A.C.S. Research Fellow in Obstetrics, Harvard Medical School. His subject is "Studies of Reproduction in the Rat. II. The Effect of Changes in Energy Production Upon Fertility, Pregnancy and Lactation." Page 1160. Address: 321 Dartmouth Street, Boston.

SCHALL, LEROY A. M.D. Jefferson Medical College 1917. F.A.C.S. Instructor in Otolaryngology, Harvard Medical School. Associate Surgeon, Massachusetts Eye and Ear Infirmary and Massachusetts General Hospital. Associate Laryngologist, Robert B. Brigham Hospital, Newton Hospital, Palmer Memorial Hospital and Huntington Memorial Hospital. Consultant Otolaryngologist, United States Marine Hospital, and Boston Dispensary. His subject is "Progress in Laryngology." Page 1162. Address: 270 Commonwealth Avenue, Boston.

SCANNELL, DAVID D. A.B., M.D. Harvard University Medical School 1900. F.A.C.S. Senior Surgeon-In-Chief, Boston City Hospital. His subject is "A Fatal Case of Amoebic Dysentery." Page 1171. Address: 475 Commonwealth Avenue, Boston.

MISCELLANY

FREE WHEELING IN THE TUBERCULOSIS MOVEMENT

BY DR. H. E. KLEINSCHMIDT

Director, Health Education, National Tuberculosis Association

Steadily, for more than a quarter of a century, the number of deaths from tuberculosis has grown less. In 1900 the death rate from this disease was 202 per 100,000 population. This rate has declined on an average of about 4½ points each year so that in 1930 the rate was 71 per 100,000 population. Until the beginning of the depression this favorable trend was attributed by health officers mostly to a steadily rising plane of living of the American people. Other factors, of course, were given due credit, but what could be more logical than to assume that tuberculosis, a disease known for centuries to go hand in hand with poverty, should decline with the rise in wages, better housing, more abundant food and more leisure time?

But suddenly our prosperity buckled a wing or something, and spun off into the most desperate depression this country has ever seen. No wonder that from various quarters one heard the prediction that the tuberculosis death rate would rise. Actually a strange thing has happened. During the four years of depression deaths from this disease have continued to decline. There stands the record of the past four years. It gives us no inkling of what may happen in the future, but it is a strange phenomenon. How can we account for it? Have our previous teachings been wrong or is there something unusual about this particular depression?

Of all the explanations offered the one which seems most probable is that the momentum of the tuberculosis movement has been carrying us through, just as the free wheeling device on the auto enables the car to speed on for some distance with a minimum consumption of gas. Thirty years ago tuberculosis was permitted to run its course almost unmolested. Then in 1904 a few courageous doctors dared to challenge the old enemy. That set in motion the popular movement which since then has built in this country more than 600 sanatoria, established diagnostic clinics in nearly every community, mobilized an army of public health nurses and broadcast knowledge about tuberculosis to the remotest corners of the land. Thanks largely to the money derived from the sale of Christmas seals the movement gained power year by year. Once going, even the drastic economies of these recent times could not, apparently, stop the good effects.

How long the tuberculosis movement can continue on free wheeling no one knows. Certainly it cannot be indefinitely. In an emergency the American people can do great things. Health departments and sanatoria have continued to function with meager funds. Cheap food, low wages and the loyalty of employees have enabled them to do so. Some doctors and nurses have worked on for nothing more than board and lodging. But that cannot go on. Sooner or later sanatoria if not properly supported will have to close their doors. The patients will be thrown back on their helpless communities soon to die. Well people compelled to live with them will be in danger of getting the disease. Without the watchful care of the public health nurse the control of the spreaders will relax and more disease will follow. And so with the other measures necessary to keep a controlling hand over tuberculosis. On an up-grade free wheeling is no good whatever.

Health is won by long-time planning. Tuberculosis does not kill immediately. Nor can it be kept down by occasional spurts of energy. Only by steady progress can we hope to overcome it.

The object of tuberculosis associations is to keep the tuberculosis machine running, powerfully and smoothly. Lost momentum must be regained. The end of the hard journey to the place where every family can be assured of safety against

tuberculosis is not yet in sight. If we roll back now our children will have to re-travel much of the hard-earned progress won in the past, and in the meantime many of them will sacrifice their lives. Harsh economy must no doubt still be practiced but when health is at stake penny pinching is expensive business and leads only to more expense. A quick pick-up is the order of the present day. Christmas seals stimulate health work of all kinds and furnish the power to carry on the fight against tuberculosis.

CORRESPONDENCE

AMOEBIC DYSENTERY IN MASSACHUSETTS

The Commonwealth of Massachusetts
Department of Public Health
State House, Boston

December 4, 1933.

Editor, *New England Journal of Medicine,*

The medical and lay press have recently had so many references to amoebic dysentery contracted in Chicago that the physicians of Massachusetts will be interested in knowing the exact situation within this State. To date sixteen cases, two of which have been fatal, have been discovered. I understand that these two fatal cases are being specially reported to you.

In the city of Beverly there have been six cases among those attending the American Legion Convention in Chicago. In addition, there have been at least four others in which a definite diagnosis has not been possible, but in which the symptoms have been suggestive of an amoebic infection. All but one of these were members of the Beverly Drum Corps and had meals at one of the hotels known to have been responsible for the spread of the infection. It is impossible to determine at present where the remaining person obtained his meals.

In Canton there have been three cases and in Winchester one, likewise among Legionnaires and likewise emanating from this same hotel. Another Legionnaire is ill in Worcester, though his infection was apparently contracted from a still unrecognized source.

Another Legionnaire in Needham has recently died of what was apparently amoebic dysentery, complicated by a liver abscess. The information as to his source of infection is still incomplete.

Among those that visited Chicago but had no connection with the Legion Convention there have been four recognized cases, two in Boston, one in Brookline and one in Reading. All of these obtained meals at the hotel which was originally under suspicion, though their dates of visit to this hotel ranged from early July to the 29th of October. This later case is of specific significance, indicating that the control measures which have been given so much publicity in the journals and in the press have not been effective in eliminating the sources of infection. One of this group of cases resulted fatally.

From the evidence now available, it would seem that the cases of amoebic dysentery emanating from Chicago have all originated in three or four food handling establishments. While the attack rate among those eating at these places has been fairly high, there is no apparent reason for apprehension as to any undue menace to those who did not eat at these particular establishments. Control measures apparently lie in the direction of adequate sanitation of all places where food is being handled for public consumption, this to include provision for and insistence upon the use of adequate hand washing faciiities. I am enclosing a copy of a letter being sent out to all Massachusetts boards of health stressing this particular point.

Very truly yours,

HENRY D. CHADWICK, M.D.,
Commissioner of Public Health.

The Commonwealth of Massachusetts
Department of Public Health
State House, Boston

December 4, 1933.

To Local Boards of Health:
Gentlemen:

As more information comes to light regarding the cases of amoebic dysentery originating in Chicago, it is increasingly apparent that most, if not all, of the cases had their origin in a very few food handling establishments. There was apparently no widespread infection throughout the city so there is, therefore, no reason for expecting any great wave of amoebic dysentery among those who were in Chicago during the summer.

The routine examination of all food handlers for amoebic dysentery carriers is for technical reasons impractical at the present. It is, however, obvious that through strict cleanliness, the possibility of such spread may be minimized. This entails the provision of adequate hand washing facilities and insistence that all food handlers shall thoroughly wash and scrub the hands and arms before the actual handling of food. Many boards of health have already adopted regulations covering this matter. Those that have not formally adopted such regulations will find in Section 305A of Chapter 111 of the General Laws adequate authority for insistence upon clean and sanitary conditions in food handling establishments. May we suggest that you look into the food handling establishments within your community, insisting upon the strictest precautions as to cleanliness on the part of all food handlers.

Very truly yours,

HENRY D. CHADWICK, M.D.,
Commissioner of Public Health.

"VITAMIN D MILK IN THE TREATMENT OF INFANTILE RICKETS"

Editor, *New England Journal of Medicine,*

In the November 2nd issue of this *Journal,* Kramer and Gittleman published a paper, bearing the above title, which concerns itself with the relative

merits of irradiated milk and of "yeast milk," by which is meant milk which has been rendered antirachitic by feeding activated yeast to cows. The paper, in the main, considers a series of investigations which I have published during the past few years with various collaborators, more particularly with Dr. J. M. Lewis. The authors are in agreement with us in considering both of these antirachitic milks potent and of therapeutic value. They disagree, however, in our conclusion that almost twice as many "rat units" of yeast milk are required to prevent or to cure rickets satisfactorily as of irradiated milk. As there are numerous inaccuracies in their paper and as the data require interpretation, I am asking you to give space to these few lines of explanation.

In the first place, they are in error in stating that assays of the vitamin D content of the milk are missing in the paper of 1931 (*J. A. M. A.*, 97, p. 373); in the second place, the 1932 article embraced over 100 babies and not merely 36, and included not only preventive but 14 curative cases, all of which manifested healing after the irradiated milk had been given for a period of four weeks. Furthermore, the citation to the effect that Gerstenberger and Horesch found that the milk of cows fed irradiated ergosterol containing 50 units of vitamin D to the quart sufficed to cure rickets, is not in accordance with the conclusion of these authors which reads: "the milk possessed antirachitic powers, but these were not of great magnitude," indeed the authors call attention to the "mildness of the antirachitic quality of the milk". These, however, are matters of secondary importance. Attention should be called to the fact that there is a paper dealing specifically with the question of the relative potencies of these two milks published by Dr. Lewis and me in the July 15th issue of the *Journal of the American Medical Association.*

Turning to the question of controls, we would call attention to the fact that these are of two kinds. One comprising cases which are untreated; this procedure is necessary if the test is carried out during the summer or spring months. For many years we have made it a rule, which has been observed by others, that all clinical tests of antirachitics be discontinued about the end of March in order to avoid the danger of spontaneous healing. Kramer and Gittleman, however, did not follow this precaution, but carried out their investigations during the months of April, May and June, extending them even into July. Under such conditions "untreated controls" are imperative, as is well illustrated by the fact that of their three untreated control cases, two manifested healing of the epiphyses in radiographs, one "definite healing" and the other "advanced healing". The other type of control experiment would be a test of the comparative potencies of the two milks by feeding them at a lower level which is inadequate and a higher level which is adequate. Such controls will be found especially in the paper of July 15 of this year.

To us the outstanding factor which precludes drawing even a tentative conclusion from the work of Kramer and Gittleman, is that two of the three control cases showed spontaneous healing, coupled with the fact that only three children were given 40 vitamin D units daily of the yeast milk, the amount claimed to be as potent as the irradiated milk. This little group of cases clearly constitutes the crux of the question. Are not three infants too small a number on which to base a general conclusion, especially of a quantitative nature, in regard to the potency of a therapeutic agent? We are of the opinion that they are and all the more so when the outcome is associated with manifest healing in two of the untreated control cases.

But the compelling reason for giving irradiated milk the preference as "*the communal antirachitic*" is not in virtue of its greater potency unit for unit, but because of its superior practicability for the use in cities, owing to the fact that it can be activated readily in bulk in central stations, and, furthermore, because its potency can be easily controlled in comparison with the laborious control of yeast milk in thousands of widely scattered farms where the milk must be assayed or inspectors must make certain that adequate amounts of activated yeast are fed daily to each and every herd.

ALFRED F. HESS.

16 West 86th Street,
New York City.

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

535 North Dearborn Street, Chicago, Illinois,
November 27, 1933.

Managing Editor,
The *New England Journal of Medicine,*

In addition to the articles enumerated in our letter of October 30 the following have been accepted:

Abbott Laboratories
- Abbott's Haliver Oil, Plain Capsules
- Phenobarbital Sodium—Abbott

Lederle Laboratories, Inc.
- Gas Gangrene Antitoxin Polyvalent—Not Refined
- Antipneumococcic Serum, Refined and Concentrated, Type II

Mead Johnson & Co.
- Mead's Viosterol in Halibut Liver Oil 250-D (In Capsules)

Sharp & Dohme, Inc.
- Arizona Ash Pollen Extract—Mulford; Barnyard Grass Pollen Extract—Mulford; Birch Pollen Extract — Mulford; Chrysanthemum Pollen Extract—Mulford; Hemp Pollen Extract—Mulford; Mesquite Pollen Extract—Mulford; Papaw Pollen Extract—Mulford; Primrose Pollen Extract — Mulford; Arizona Walnut Pollen Extract — Mulford; Sycamore Pollen Extract — Mulford; Saw Grass Pollen Ex-

tract—Mulford; Sagewort Pollen Extract—Mulford; Prairie Sage Pollen Extract—Mulford; Pasture Sage Pollen Extract—Mulford.

E. R. Squibb & Sons
Concentrated Antipneumococcus Serum Types I and II
Diluted Diphtheria Toxoid for Reaction Test, 1 cc. Ampule

Winthrop Chemical Co., Inc.
Luminal Sodium Solution in Ethylene Glycol

Yours very truly,
PAUL NICHOLAS LEECH, *Secretary*,
Council on Pharmacy and Chemistry.

REPORTS OF INTERVIEWS FOR NEWSPAPER ARTICLES SHOULD BE SUBMITTED TO AUTHORS

Beth Israel Hospital
November 16, 1933.

New England Journal of Medicine,

We desire to call attention to the fact that a letter recently printed in the *New England Journal of Medicine** commenting on an article published in the *Transcript* did not intend to reflect on the integrity of the *Transcript* or its representatives. Persons who gave the interview at the Beth Israel Hospital were of the impression that they would read the final proofs of the statement given before it was published. The representative of the *Transcript* was of the impression that the reading of the manuscript which was done by one of those interviewed would be sufficient. In view of this misunderstanding, we emphasize the desirability of insisting on the reading of the final proofs before publication.

Very truly yours,
CHARLES F. WILINSKY, M.D., *Director.*

*October 12, 1933, page 760.

RECENT DEATHS

BEATON — ARCHIBALD E. BEATON, M.D., of the Savin Hill District, Dorchester, Massachusetts, died November 23, 1933. He graduated from the Baltimore Medical College in 1896, and practiced for thirty-eight years in Dorchester. He was born in Mabou, N. S.

Dr. Beaton is survived by his widow, a son, two daughters, and a brother, Angus Beaton.

PARK—ISAAC P. PARK, M.D., of 234 Beach Street, Revere, died at his home November 26, 1933.

Dr. Park was born in Stockton Springs, Maine, in 1867. He graduated in medicine from the Bowdoin Medical School in 1892, and practiced in Revere for more than forty years.

He is survived by his widow, Mrs. Jennie Hunter Park, and a son, Dr. Linwood Park, of Medfield.

OBITUARY

RESOLUTIONS BY THE STAFF OF LYNN HOSPITAL UPON THE DEATH OF MURDOCH CAMPBELL SMITH, M.D., D.D.S.

Death has taken from us our colleague, Dr. Murdoch Campbell Smith. Dr. Smith was born in Nova Scotia but came to the United States in his young manhood and for the past forty years practiced dentistry in Lynn. He also held a degree in medicine.

He was an energetic, tireless worker and possessed the spirit of an investigator, often pursuing the bizarre and unusual. His most shining quality was his kindness of heart. He gave freely of his services throughout his professional life, was always ready to answer a call for help, and no trouble or effort was too great for him to undertake. He will long be remembered by the many beneficiaries of his charity.

It is the sense of this body that the Staff of Lynn Hospital has suffered the loss of a friend and energetic co-worker and the community has lost a good citizen.

WILLIAM T. HOPKINS, M.D.,
Committee on Resolutions.

NOTICES

POSTGRADUATE INSTRUCTION

MASSACHUSETTS MEDICAL SOCIETY

The Executive Committee on Postgraduate Instruction announces that the Extension Courses will be discontinued over the holiday season from December 16 to January 8, 1934.

The districts which have not started their courses will begin shortly after January 8, 1934. Announcement of the beginning of the courses in each District will be made by each District Chairman on Postgraduate Instruction.

LEROY E. PARKINS, M.D., *Secretary*,
Executive Committee
on Postgraduate Instruction.

SUFFOLK DISTRICT MEDICAL SOCIETY

The second session of the Suffolk District Medical Society Postgraduate Extension Course will be held on Wednesday, December 13, 1933.

Subjects:

1. Anemia, Its Etiology and Treatment.—George R. Minot, M.D.

2. Diagnosis and Treatment of Diseases of the White Blood Cells.—Henry Jackson, Jr., M.D.

Time and Place:

4:00-6:00 P.M., Sprague Hall, Boston Medical Library.

FRANK R. OBER, M.D., *Chairman.*

NORFOLK DISTRICT MEDICAL SOCIETY

Courses will be discontinued from December 16 until January 8, 1934, on account of the holiday season.

Courses will be resumed as follows:

1. Faulkner Hospital, January 8, 1934, at 3:30 P.M.
2. Boston City Hospital (Staff Conference Room), January 10, 1934, at 4:00 P.M.
3. Norwood Hospital, January 12, 1934, at 8:30 P.M.

FRANK S. CRUICKSHANK, M.D.,
District Chairman.

REMOVAL

JOHN B. SEARS, M.D., announces the removal of his office to the Lister Building, 475 Commonwealth Avenue, Boston.

BOSTON MEDICAL LIBRARY

8 THE FENWAY, BOSTON, MASS.

The Library cordially invites you to visit an exhibition of manuscripts, printed books and broadsides of the 13th to the 15th centuries illustrating the development of the medical book.

Exhibition open until December 24th.

Hours 10 A.M. to 5 P.M.

CLINIC AT THE PETER BENT BRIGHAM HOSPITAL

On Thursday, December 14, in the amphitheatre of the Peter Bent Brigham Hospital at 3:30 P.M. there will be a clinic conducted by Dr. Henry A. Christian, Hersey Professor of the Theory and Practice of Physic in the Harvard Medical School, to which physicians are cordially invited.

MASSACHUSETTS GENERAL HOSPITAL

The exercises at the Massachusetts General Hospital on Thursday forenoons are of especial interest to physicians. For details see the regular announcement on page xiv.

RADIO HEALTH MESSAGES

DECEMBER, 1933

HEALTH MESSAGES

Sponsorship: Public Education Committee of the Massachusetts Medical Society and Massachusetts Department of Public Health.

Courtesy WBZ. Fridays, 4:30 P.M.

Dec.

8 Infantile Paralysis
15 The Preschool Child
22 Cancer of the Intestinal Tract
29 Preventive Medicine from Your Family Physician

STATE HOUSE BROADCAST

Sponsored by the Massachusetts Department of Public Health.

Courtesy WEEI. Fridays, 1:15 P.M.

Health Subjects of Public Interest discussed by the Division Directors of the Department.

RADIO HEALTH FORUM

Queries from the public are answered under the sponsorship of the Department of Public Health.

Courtesy WEEI. Fridays, 5:00 P.M.

Questions on Health and Prevention of Disease may be sent to Radio Health Forum, State Department of Public Health, State House, Boston.

The Massachusetts Medical Society

For Christmas gifts, an appropriate suggestion is Viets' "A Brief History of Medicine in Massachusetts," offered for sale by the Society. Single copies, $1. 2 copies, $1.75. 3 copies, $2.25.

Send your order now to the Treasurer together with your check. Books will be sent promptly.

C. S. BUTLER, M.D., *Treasurer,*
8 Fenway, Boston.

THE AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY

EXAMINATIONS FOR CERTIFICATES

The American Board of Dermatology and Syphilology will hold oral examinations for candidates for both Group A (those physicians who have limited their practice to dermatology and syphilology for ten years or more) and Group B (those who have limited their practice to dermatology and syphilology for at least five years including their period of training) on December 15 and 16 in New York City.

Application blanks and further information may be obtained from the Secretary, Dr. C. Guy Lane, 416 Marlborough Street, Boston, Massachusetts.

REPORTS AND NOTICES OF MEETINGS

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

The Essex South District Medical Society held its regular meeting at Salem Hospital, November 8, 1933, offering the following program:

5 P.M.—Dr. James E. Simpson, President of Staff, Presiding

1. Dr. Harold C. Bean
   Osteomyelitis of Tibia.
   Multiple Fractures of Cervical Vertebrae.
2. Dr. John G. Adams
   Bronchoscopy.
3. Dr. Edgar A. Wright
   Osteomyelitis of Jaw.
4. Dr. Edward L. Peirson, Jr.
   Tuberculosis of the Kidney and Transplantation of Solitary Ureter.

5. Dr. Charles L. Curtis
Plastic Surgery for Keloids.
6. Dr. J. Robert Shaughnessy
Report of State Pneumonia Collaborators.
7. Dr. J. Frank Donaldson
Multiple Calcified Glands.
8. Dr. Charles F. Branch
Bleeding from the Gastro-Intestinal Tract.
9. Dr. Walter G. Phippen
Diaphragmatic Hernia.
10. Dr. Stuart N. Gardner
A Case of Primary Anemia.
11. Dr. Thomas Barrett
Progressive Muscular Dystrophy.
12. Dr. Donald Nickerson
Some Aspects of Aschheim-Zondek Test.

7 P.M.—Dinner. Nurses' Dining Room.

8 P.M.—Evening Program. Auditorium of Nurses' Home. Speaker—Dr. John Lovett Morse.

The society was additionally fortunate in receiving as its guest the president of the parent society, Dr. William H. Robey, whose remarks were warmly applauded.

WM. T. HOPKINS, M.D., *Reporter.*

LYNN MEDICAL FRATERNITY

The Lynn Medical Fraternity held its regular meeting at the Willey House, Swampscott, on Thursday evening, November 23, 1933, at 8:30 P.M.

Speaker—William Dameshek, M.D.

Subject—Interesting Blood Diseases Met with in the Practice of General Medicine.

WM. T. HOPKINS, M.D., *Reporter.*

THE CARE OF THE PATIENT

The first of the two lectures on "The Care of the Patient" for this year was given by Dr. John Homans on Thursday, November 9, at 5 P.M. in the amphitheatre of Building C at the Harvard Medical School. Drawing from his long experience in the field of surgery, Dr. Homans presented the audience with invaluable advice regarding the care of patients in both home and hospital. The physician only too frequently neglects to give adequate instructions for the treatment of patients. Directions should be given in minute detail and nothing should be taken for granted.

When the practitioner is faced with diseased states which fail to excite his interest and as to which he recognizes his own and perhaps a general ignorance, he will do well to force himself to study them seriously. The patient, the science of medicine, and he himself may equally benefit. He is frequently confronted with the question of whether to omit such procedures as rectal, vaginal, and other examinations. This is especially the case in private practice. To avoid the serious consequences that may follow such omissions, the physician should make all examinations as a matter of course from the very time he begins his practice. By the same token, procedures in treatment, when believed helpful, are never to be omitted however painful or uncomfortable they may be for the time being. The passage of a stomach tube postoperatively has saved the life of the patient time and again.

In a discussion of what he termed "surgical conscience," Dr. Homans warned against surgery in patients in whom there is a possibility that the operation will create complaints in addition to those already present, especially when there is doubt concerning the relief of the latter by operation. When such a situation arises, the surgeon's only excuse is that it occurred in spite of all precautions and foresight. In every case, the simplest procedure is to be the one of choice. The kind of anesthetic is to be chosen with the utmost care. The surgeon should do no more operating than the situation at hand warrants. It is poor judgment to do a prophylactic appendicectomy at the time of a cholecystectomy in a middle-aged woman whose years have begun to show. "It is better to have a live patient with a few troubles than a dead one without any." In emergencies, however, and in conditions which, if untreated, carry a 100% mortality, the surgeon's courage and ingenuity are to precede his conservativeness.

A warning was given against operations in cases where the symptoms are probably functional. Psychoneurosis is the frequent end-result. Proper surgery should afford the patient more relief than is promised.

Dr. Homans then discussed some of the principles to follow in telling patients about their illnesses. In the typical young woman whose symptoms and signs warrant the diagnosis of "Recurrent Appendicitis," there is a choice between two methods: (1) tell her that an operation is essential, or (2) explain the situation, express an opinion, and let her decide for herself. Even more difficult problems arise regarding what to tell a patient afflicted with a fatal illness. In some cases it is wise to conceal the facts because of the effect they may have on the patient's outlook. The members of the family often become desperate on learning the serious nature of the case and immediately set out in search of various remedies and quacks. On the other hand, it is often wise to give the patient some insight into his condition so that he may have time to settle his affairs and to complete work that he may have started.

THE GREATER BOSTON MEDICAL SOCIETY

A joint meeting of the Greater Boston Medical Society and the Staff of the Beth Israel Hospital was held in the amphitheatre of the hospital on Tuesday evening, November 7. Dr. Maurice E. Barron presided.

The principal address of the evening was delivered by Dr. Edgar Mayer, formerly of Saranac Lake and now Professor of Medicine at Cornell Univer-

sity Medical School, on the subject, "Cavities of the Lungs in Tuberculosis—Their Management." The speaker commenced by attempting to dispel some of the current pessimism with regard to the prognosis in tuberculosis when there is cavitation. Whereas the mortality statistics in the literature in these instances may show figures as high as 90 per cent, by careful study and treatment there may be reduction to about 60 per cent, anyway. Timely intervention is the important thing. The fact that cavities are present is not so important as their size, location, and nature. The type and extent of the disease as a whole, and the general condition of the patient also are key factors, and much more important than whether cavities are present.

The production of cavitation in experimental rabbits was discussed. The reasons for this work were for the purposes of studying the treatment of cavities, and attempting to correlate the x-ray shadows with pathological and clinical findings. Cavity formation may be an acute fulminating process, especially in sensitized individuals.

The standard procedures in treatment were discussed briefly. First of all, the physician must distinguish between the types of cavities, the early infiltrated ones with soft walls, and the older rigid cavities. Fifty per cent of the early cavities clear up with rest alone as therapeusis. Pneumothorax, phrenicectomy, and thoracoplasty are reserved for later therapeutic resources. Selective collapse of the affected part is the ideal to strive for. Oleothorax is used very occasionally to keep the lung collapsed. In concluding, Dr. Mayer summed up the diagnostic criteria in the study of cavities, serial x-ray films, white blood count of over 9000, a shift to the left in the Schilling index, more than 16 per cent nonfilamentous polymorphonuclear cells in the smear, a Gaffky count of over four in the sputum; all are used together in the follow-up of the evolution of cavitation.

Dr. E. D. Churchill, Professor of Surgery at the Harvard Medical School, opened the discussion. He also stressed the importance of differentiating the early elastic and the old rigid cavities. It is futile to judge the individual case from series or group statistics. Dr. Churchill went on to point out that the chief concern of the surgeon is, of course, the rigid wall cavity, in the treatment of which thoracoplasty was very briefly reviewed and the present operation, featured by the removal of practically all of the first three ribs, described.

Dr. Moses J. Stone spoke of the changing interest in tuberculosis toward the newer methods of treatment. Dr. Stone believes that harm is done by the over-use of pneumothorax in treatment, and that it should not be employed for more than two and a half years in any individual case.

Dr. Mark H. Joress added that while bed rest is still the fundamental therapeutic agent in the care of tuberculosis, we should not wait too long before instituting some form of collapse therapy. The important teachings derived from the evening's meeting were the concepts of timely intervention and the evolution of the cavity during the tuberculous process.

BRISTOL COUNTY ORTHOPAEDIC CLUB

At a dinner meeting of the Bristol Orthopaedic Club at the New Bedford Hotel, New Bedford, Massachusetts, Thursday evening, November 23, Ernest A. Codman, M.D., of Boston, spoke on "Painful Shoulders."

EARLE E. HUSSEY, M.D., *Secretary.*

THE HARVARD MEDICAL SOCIETY

The Harvard Medical Society met in the amphitheatre of the Peter Bent Brigham Hospital on Tuesday, November 14, at 8:15 P.M. Dr. Henry A. Christian was chairman of the meeting.

The clinical part of the meeting consisted in the presentation of a medical and a surgical case. The former was that of a young man of 21 who had had a previous admission in 1931 when his illness began with a head cold, nausea, vomiting, epistaxis, and puffiness around the eyes. His doctor at the time found hematuria and moderate hypertension. On entry, he had a definite anemia and showed lowered renal function. He improved while in the hospital and was then discharged to be followed in the renal clinic. Since then he has had a steadily rising blood pressure and has recently begun to show eye-ground changes. His present entry followed an attack of "grippe" associated with epistaxis. His blood pressure on admission was 225/160 and there was no edema. His phthalein excretion was 45 per cent, blood urea nitrogen was 20 to 30, and his total plasma protein was 5 to 8. Occasional red cells and casts were found in the urine. The case was regarded as one of chronic glomerular nephritis with consequent hypertension or of vascular hypertension with chronic nephritis and was not followed by discussion.

The second was a surgical case, that of a 42 year old mechanic with proved pulmonary tuberculosis. Pneumothorax had been attempted but was found impossible because of pleural adhesions. Phrenicectomy had been followed by some improvement. When transferred to the Brigham Hospital from the Middlesex Sanatorium in February of this year, he showed both consolidation and cavitation in the right apex. His sputum was positive for acid-fast bacilli. A two-stage paravertebral thoracoplasty was done and his sputum became negative after an uneventful postoperative course. At his present admission he still showed cavitation and consolidation in the right apex. An anterolateral thoracoplasty was done and the patient was doing well on his sixth postoperative day. Dr. Cutler emphasized the usefulness of thoracoplasty as a therapeutic measure in pulmonary tuberculosis.

The speaker of the evening was Dr. Walter B. Cannon, Professor of Physiology at the Harvard

Medical School, who told the "story" of "The Discovery of the Chemical Mediators of Autonomic Nerve Impulses." The entire problem was opened in 1904 when T. R. Elliott found that after section and degeneration of sympathetic nerves, the injection of adrenalin produced a response similar to that normally produced by stimulation of the intact nerves. He suggested that the natural response to sympathetic stimulation was brought about by the local production of adrenalin. The following year Langley suggested that two substances are produced by sympathetic stimulation since in one place the response may be excitatory and in another inhibitory. Dixon, in 1906, postulated that the vagus acts upon the heart by changing "pro-inhibitin" to "inhibitin" within the heart and the next year published experiments demonstrating the inhibition of a frog's heart treated with an alcoholic extract of a mammalian heart previously stimulated through the vagus for half an hour. Extracts from non-stimulated hearts produced no comparable effect. The same worker in 1909 suggested that vagus stimulation and muscarine have the same effect upon the heart and that the vagus might act by liberating a muscarine-like substance.

There was no further progress until Loewi in 1921 showed that the perfusate from a heart whose vagus was being stimulated was capable, when passed through a second heart, of inhibiting the latter. It was concluded that some substance was added to the perfusing fluid by stimulation of the vagus and this was later shown to be closely related to acetyl choline, if not identical with it. A substance with opposite effects was subsequently shown to be produced by the action of the sympathetic on the heart. Experiments in other laboratories gave somewhat similar results. Demoor, however, was unwilling to accept the results because he considered the experimental conditions too unphysiological.

The next important advances in the field were made in the laboratories of physiology in the Harvard Medical School under the direction of Dr. Cannon. It was observed in cats with one adrenal removed and the other denervated, that excitement nevertheless led to an increase in the rate of the denervated heart. The rise occurred practically always three or four minutes after the excitation and in spite of gonadectomy, hypophysectomy, and other procedures. The phenomenon was finally explained about three years ago when it was found to be absent after the excision of every bit of the sympathetic chains. From this work arose the idea that some substance was produced from stimulated smooth muscle and, carried by the blood stream, acted upon distant organs. This was conclusively demonstrated by the production of an increased rate in the denervated heart when stimulation of the sympathetic nerves to the tail caused an erection of its hairs. The effect came about two minutes after stimulation and was readily abolished by occluding the circulation in the tail by means of a tourniquet. In these experiments Demoor's criticism obviously does not obtain. The substance thus produced in smooth muscle activity was called "sympathin". In 1932, Babkin demonstrated a similar mechanism for the parasympathetic when he obtained an increased flow of saliva from a denervated right submaxillary gland by the stimulation of the left chorda tympani. Here again Demoor's objection does not apply.

Sympathin and adrenalin were at first found to possess identical properties physiologically. Cocaine, for example, sensitizes structures to the action of either. Within the past year, however, differences have been found in the action of ergotoxine on the two substances. Ergotoxine does not abolish the positive action of sympathin as it is known to do for adrenalin. Further experiments showed that there are two kinds of sympathin, one produced in structures excited and the other in structures inhibited by the sympathetic. The two were called "Sympathin E" and "Sympathin I." The idea reminds one of the suggestion made by Langley in 1905 and mentioned above. Most recent investigations in Dr. Cannon's laboratory concern the action of chemical mediators of nerve impulses within the central nervous system itself.

BOSTON ORTHOPEDIC CLUB

The Boston Orthopedic Club held a meeting devoted to certain aspects of Industrial Surgery at the Harvard Medical School on Monday, November 13, 1933. The afternoon session was devoted to a presentation and discussion of cases representing certain forms of injuries, and then the members and guests adjourned to Vanderbilt Hall for dinner, following which three more papers were read. Dr. Arthur T. Legg, president of the club, presided.

The first speaker at the afternoon session was Dr. J. W. Sever, who addressed the gathering on "Industrial Backs." Four cases of back injury and complicating arthritis were presented, followed by a discussion of industrial compensation in these cases. Dr. George W. Morse then presented six cases, illustrated by x-ray films, of "Industrial Wrists." The substance of the subsequent discussion was that fractured scaphoid bones in the wrist without displacement should be immobilized in "cock-up" splints; with displacement, treated by immediate bone grafting. The third speaker was Dr. Henry C. Marble, who spoke on "Industrial Tendon Ruptures." Three cases were presented, the first a rupture of the Achilles tendon, the second of the supraspinatus tendon, and the third of the tendon of the long head of the biceps.

Dr. J. H. Shortell then presented two interesting knee cases. The first was an old fracture of both bones of the lower leg just below the knee, with injury to the lateral and cruciate ligaments. After the fracture healed, a fascial repair was done, with a resultant knee which was still quite unstable. A

lump sum settlement of $1500 was made. An excellently functioning knee was obtained at last due to the patient's care in exercising the leg, with particular attention to the quadriceps muscle. The second patient had had a loose cartilage removed from the knee with a clinically good result, but the patient, still on compensation, continued to walk with a cane. The mental attitude of the patient is thus one of the most important factors in rehabilitation of industrial injuries.

The first speaker on the evening program was Dr. D. L. Lynch, Surgeon for the New England Telephone & Telegraph Company. Dr. Lynch's paper was a very interesting account of the "benefit plan" used by this telephone company in the care of its injured employees. The company supervises all the care of its own injured. About 20,000 workers are employed in all. A committee of five has jurisdiction over compensation in all cases of injury. That the "benefit plan" is more than liberal was indicated in the citation of several examples of compensation. All accidents occurring in line of duty are reported. Then the injured person receives full pay from the first day of his disability till he is back at work, or for thirteen weeks. If the effects of the injury are prolonged beyond this time, the employee gets half pay indefinitely or until able to return to work. Because of the great variety of work the company has, of course, the convalescent injured and partially disabled man can often be put to work at a different job pending his complete recovery.

Statistics in regard to injuries were next reported. In 1924, there were 588 "loss of time" injuries, or 4.7 per 100 employees; in the first nine months of 1933, there have been only 70 such injuries, or 0.225 per 100 workers. There were 3576 minor injuries in 1924, 831 so far in 1933! In 1924 there were 9203 days "lost," in 1933 only 1347, for the first nine months. Thus there is no longer the great volume of work of previous years. The reasons for this are better first aid care, education of the workers, and coöperation by all hands. Each applicant for a position is thoroughly examined, each injury is seen at its onset and carefully followed, all persons away from work for more than a week are reëxamined, and all persons showing any sign of illness are examined physically and mentally. Those who are able to return to some kind of work are put back as soon as possible, and this, the speaker believes, cannot but prevent many neuroses. As a result of the system now in use the percentage of the payroll spent in the treatment of injuries has decreased from 2.6 in 1924 to 0.1 in 1933. Dr. Lynch concluded by citing examples of the rapidity with which the company gets the injured back to work. Most all of the back injuries involve only very brief absence from work, and ten of the most severe injuries of all, compression fractures of vertebrae, resulted in an average loss of 122.4 calendar days.

Following Dr. Lynch's paper Mr. George L. Marston of the American Mutual Liability Insurance Company and Mr. Joseph A. Parks, Chairman of the State Industrial Accident Board, gave addresses on "The Industrial Accident and the Insurance Company" and "The State Industrial Accident Compensation Act." The history of compensation legislation and the evils of the past and present system of compensation were reviewed. The meeting was adjourned by Chairman Legg at about ten-thirty o'clock.

NEW ENGLAND DERMATOLOGICAL SOCIETY

The next meeting of the New England Dermatological Society will be held on Wednesday, December 13, at 3 P.M., at the Boston City Hospital.

J. HARPER BLAISDELL, M.D., *Secretary.*

NEW ENGLAND PEDIATRIC SOCIETY

FRIDAY, DECEMBER 15, 1933

AFTERNOON SESSION—BOSTON CITY HOSPITAL

3:00 P.M.-4:00 P.M.—Inspection of New Pediatric Building (220 beds—costing $650,000).

4:00 P.M.-6:00 P.M.—Clinical meeting in Thorndike Amphitheatre by Pediatric Department of Boston City Hospital and Associates of the General Staff.

1. Lead Poisoning in Children.
   a. Case reports by Pediatric Staff.
   b. X-ray diagnostic points of lead poisoning by Dr. P. F. Butler, Chief Roentgenologist.
2. Benign Adenoma of Intestines.
   a. Case report by Pediatric Staff.
   b. Operative report by Dr. Howard Bouvé, Visiting Surgeon.
   Operative report by Dr. John Lucy, Visiting Surgeon.
   c. Pathological report by Dr. Frederic Parker, Jr., Chief Pathologist.
3. Case report Postdiphtheritic Paralysis and Cerebral Thrombosis.
4. Rhabdomyoma.
   a. Case report.
   b. Pathological report by Dr. Frederic Parker, Jr., or Dr. F. B. Mallory.
5. Comments on Septic Hip-Joint Disease and Separated Epiphysis of the Femur. Dr. Otto J. Hermann, Chief Orthopedic Surgeon.
6. Neuroblastoma.
   a. Case report by Pediatric Staff.
   b. Pathological report by Dr. Frederic Parker, Jr., Chief Pathologist.
7. Two cases of Tetany.
   a. Pediatric Staff.
8. Relation of Cholesterol to Atherosclerosis with microphotographs by Dr. Timothy Leary, Medical Examiner, Southern Suffolk District. (Comment desired.)

6:00 P.M. to 7:00 P.M.—Buffet Supper. (Through courtesy, Board of Trustees, Boston City Hospital.)

EVENING SESSION—BOSTON MEDICAL LIBRARY

(Election of Officers and the Awarding of the New England Pediatric Society Prize will take place at this meeting.)

8:15 P.M.—Streptococcus Sore Throat—Dr. Edwin Place.

Discussion.

a. Dr. J. Howard Mueller.

b. Dr. Conrad Wesselhoeft.

Refreshments.

GERALD HOFFEL, M.D., *Secretary.*

MASSACHUSETTS PSYCHIATRIC SOCIETY

The next meeting of the Massachusetts Psychiatric Society will be held at the Boston Psychopathic Hospital on Wednesday evening, December 13, 1933. The following papers will appear on the program:

"The Arm to Carotid Circulation in Schizophrenia," by Dr. H. Freeman of the Research Staff, Worcester State Hospital. Discussion to be initiated by Drs. Herrman L. Blumgart and William Dameshek.

"An Experimental Study of Hypnotically Induced Complexes," by P. E. Huston, D. Shakow, and M. H. Erickson. Discussion to be initiated by Drs. F. Lyman Wells, John C. Whitehorn, and Martin W. Peck.

OSCAR J. RAEDER, M.D., *Secretary.*

MASSACHUSETTS PHYSIOTHERAPY ASSOCIATION, INC.

The meeting of the Massachusetts Physiotherapy Association, Inc., will be held at the Hotel Kenmore on Tuesday, December 12, at 8:00 P.M. Dr. Alexander S. Begg will speak on "Recent Developments in the Field of Medicine."

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital Amphitheatre (Van Dyke Street entrance), Tuesday evening, December 12, at 8:15 o'clock.

PROGRAM

Presentation of Cases.

Chemistry of the Thyroid Hormone. By Dr. W. T. Salter.

Effect of Anterior Lobe Hormones on Thyroid and Parathyroid. By Dr. S. Hertz.

Total and Thyroxin Iodine in Relation to Dosage of Thyroid. By Dr. J. Lerman.

Some Atypical Clinical Pictures of Thyrotoxicosis. By Dr. J. H. Means.

JOHN HOMANS, M.D., *Secretary.*

SOUTH END MEDICAL CLUB

The next regular meeting of the South End Medical Club will be held at the office of the Boston Tuberculosis Association, 554 Columbus Avenue, Boston, on Tuesday, December 19, 1933, at 12 noon. The speaker will be Charles C. Lund, M.D., Surgeon to the Collis P. Huntington Memorial Hospital; Assistant Surgeon, Boston City Hospital, Instructor in Surgery, Harvard Medical School. His subject will be "Acute Ulcerated Colitis Amoebic and Non-Amoebic." All physicians are cordially invited to attend. The usual luncheon will be served at 1 o'clock.

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

December 7—Faulkner Hospital Clinical Meeting at 5:00 P.M.

December 8—William Harvey Society will meet at 8:00 P.M. in the auditorium of the Beth Israel Hospital.

December 12—Harvard Medical Society. See notice elsewhere on this page.

December 12—Massachusetts Physiotherapy Association, Inc. See notice elsewhere on this page.

December 13—New England Dermatological Society. See page 1188.

December 13—Massachusetts Psychiatric Society. See notice elsewhere on this page.

December 14—Clinic at the Peter Bent Brigham Hospital. See page 1184.

December 15—New England Pediatric Society. See page 1188.

December 15 and 16—The American Board of Dermatology and Syphilology will hold oral examinations in New York City. Information may be obtained from the Secretary, Dr. C. Guy Lane, 416 Marlborough Street, Boston, Mass. See page 1184.

December 17, January 15—Boston Medical History Club.

Program:

December 17, 1933—Professor Norman E. Himes, of Colgate University, "Medical History of Contraception."

January 15, 1934—Professor Henry E. Sigerist, Director of the Institute of Medical History of Johns Hopkins University.

JAMES F. BALLARD, Secretary.

Boston Medical Library, 8 The Fenway, Boston.

December 19—South End Medical Club. See notice elsewhere on this page.

February 16 and 17—The New England Hospital Association is holding its Twelfth Annual Meeting at the University Club, Boston. For details write Dr. A. G. Engelbach, Massachusetts General Hospital, Boston.

April 16-20, 1934—The American College of Physicians will hold its Eighteenth Annual Clinical Session in Chicago at the Palmer House. For information write Mr. E. R. Loveland, Executive Secretary, 133-135 South 36th Street, Philadelphia, Pa.

July 24-31, 1934—The IVth International Congress of Radiology will be held in Zurich under the presidency of Professor H. R. Schniz. General Secretary Dr. H. E. Walther, Gloriastrasse 14, Zurich.

September 4, 5, 6, 1934—International Union Against Tuberculosis will be held in Warsaw. For particulars address The National Tuberculosis Association, 450 Seventh Avenue, New York, N. Y.

DISTRICT MEDICAL SOCIETIES

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

Wednesday, January 3—Danvers State Hospital. Clinic 5 P.M. Dinner 7 P.M. Speaker: Dr. Clarence A. Bonner, Superintendent of Danvers State Hospital. Subject: Recent Experiences in Foreign Clinics.

February 7—Council Meeting, Boston.

Wednesday, March 7—Lynn Hospital. Clinic 5 P.M. Dinner 7 P.M. Speaker: Dr. Frank H. Lahey, Boston. Subject to be announced. Film Electrocardiogram.

Wednesday, April 4—Essex Sanatorium, Middleton. Clinic 5 P.M. Dinner 7 P.M. Speakers: Dr. Elliott P. Joslin and Dr. Howard F. Root, Boston. Subject: "Tuberculosis Complicating Diabetes."

Thursday, May 3—Censors' Meeting, at Salem Hospital, 3:30 P.M.

Tuesday, May 8—Annual Meeting. Salem Country Club, Forrest Street, Peabody. Dinner at 7. Speaker to be announced. Subject to be announced.

RALPH E. STONE, M.D., Secretary.

221 Cabot Street, Beverly, Mass.

FRANKLIN DISTRICT MEDICAL SOCIETY

Meetings will be held on the second Tuesday of January, March and May at the Weldon Hotel, Greenfield, at 11 A.M.

CHARLES MOLINE, M.D., Secretary.

Sunderland, Mass.

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

Meetings will take place on January 10 at Melrose, March (2nd Wednesday) at Wakefield, and May (2nd Wednesday) at Winchester.

ALLAN R. CUNNINGHAM, M.D., Secretary.

76 Church Street, Winchester, Mass.

MIDDLESEX NORTH DISTRICT MEDICAL SOCIETY

Meetings will be held on January 31, and April 25 (Annual Meeting).

T. A. STAMAS, M.D., Secretary.

226 Central Street, Lowell, Mass.

NORFOLK DISTRICT MEDICAL SOCIETY

Postgraduate Course. See page 1184.

January 28—Tentatively Roxbury Masonic Temple, 8 P.M. Continuance of Symposium on Diseases of the Blood. Dr. Dameshek and Dr. Straus.

February 27—Place, time, subject, and speaker to be announced.

March 27—Place and time to be announced. Dr. Edward A. Edwards and Dr. Henry H. Faxon. Symposium on the Treatment of Varicose Veins.

May—Annual Meeting. Place, time and program to be announced.

FRANK S. CRUICKSHANK, M.D., Secretary.

1695 Beacon Street, Brookline, Mass.

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY

December 7—12 noon at Quincy City Hospital. Program by the hospital staff.

January 4—12 noon at Norfolk County Hospital. Speaker to be announced.

February 1—12 noon at Norfolk County Hospital. Stated Meeting. Speaker: Dr. Sara Jordan. Subject: Stomach Ulcers.

March 1—12 noon at Quincy City Hospital. Program by the hospital staff.

April 5—12 noon at Norfolk County Hospital. Speaker Dr. Elliott P. Joslin. Subject: Diabetes.

May 3—12 noon at Norfolk County Hospital. Annual Meeting. Election of Officers.

N. R. PILLSBURY, M.D., Secretary.

Norfolk County Hospital, South Braintree, Mass.

SUFFOLK DISTRICT MEDICAL SOCIETY

December 13—Postgraduate Instruction. See page 1183.

January 31—General Meeting in association with the Boston Medical Library and the Trudeau Society. Speaker: Dr. Lawrason Brown of Saranac Lake.

March 28—Clinical Meeting at the Massachusetts Memorial Hospitals.

April 25—Annual Meeting at the Boston Medical Library. Election of Officers. Scientific Program, titles and speakers to be announced.

The Medical Profession is cordially invited to attend all of these meetings.

JAMES H. MEANS, M.D., Vice-President.
GEORGE P. REYNOLDS, M.D., Secretary,
311 Beacon Street, Boston, Mass.
ALEXANDER S. BEGG, M.D.,
Boston Medical Library.

WORCESTER DISTRICT MEDICAL SOCIETY

All meetings to be held on Wednesdays as follows:

December 13—Dinner and scientific program at St. Vincent Hospital, Worcester, Mass.

January 10—Dinner and scientific program at the Worcester City Hospital, Worcester, Mass.

February 14—Dinner and scientific program at the Worcester State Hospital, Worcester, Mass.

March 14—Dinner and scientific program at the Memorial Hospital, Worcester, Mass.

April 11—Open date.

May 9—Annual Meeting. Time and place to be announced later.

ERWIN C. MILLER, M.D., Secretary.

27 Elm Street, Worcester, Mass.

BOOKS RECEIVED FOR REVIEW

General Index to Volumes I to III of Curtis' Obstetrics and Gynecology by Arthur Hale Curtis, Editor. Published by W. B. Saunders Company. 137 Pages.

Diseases of the Chest and the Principles of Physical Diagnosis by George William Norris, and Henry R. M. Landis with a chapter on the *Transmission of Sounds Through the Chest* by Charles M. Montgomery. Fifth Edition. Published by W. B. Saunders Company. 997 Pages. Price $10.00.

Industrial Health Service by Leverett Dale Bristol. Published by Lea & Febiger. 170 Pages. Price $2.00.

If I Have Children by G. Francis Smith. Published by Oxford University Press. 133 Pages. Price $1.75.

Food, Nutrition and Health by E. V. McCollum, and J. Ernestine Becker. Published by E. V. McCollum, and J. Ernestine Becker. 146 Pages. Price $1.50.

Starling's Principles of Human Physiology by C. Lovatt Evans. Sixth Edition. Published by Lea & Febiger. 1122 Pages. Price $8.75.

Pathogenic Microörganisms by William Hallock Park, and Anna Wessels Williams. Tenth Edition. Published by Lea & Febiger. 867 Pages. Price $7.00.

Some Modern Extensions of Beaumont's Studies on Alexis St. Martin by W. B. Cannon. Reprinted from *The Journal of the Michigan State Medical Society* March-May, 1933. 87 Pages.

Studies from The Rockefeller Institute for Medical Research. Reprints, Volume 86. Published by The Rockefeller Institute for Medical Research. 621 Pages.

A Text-Book of Medicine by American Authors. Third Edition. Edited by Russell L. Cecil. Published by W. B. Saunders Company. 1664 Pages. Price $9.00.

Annals of Roentgenology. A series of Monographic Atlases. Volume Fifteen. Edited by James T. Case. *Nasal Accessory Sinuses* by Frederick M. Law. Published by Paul B. Hoeber, Inc. 215 Pages. Price $10.00.

Étude et Traitement de la Méningite Tuberculeuse par Thérèse A. Jousset. Published by Masson et Cie. 152 Pages. Price 30 fr.

Les Arachnoïdites Spinales Adhésives par Dem. Paulian et D. Turnesco. Published by Masson et Cie. 93 Pages. Price 24 fr.

Les Troubles de L'Élimination Urinaire de L'eau par Jules Cottet. Published by Masson et Cie. 260 Pages. Price 32 fr.

La Cellulite par L. Alquier. Published by Masson et Cie. 285 Pages. Price 30 fr.

The Annual Report for 1932, Rockefeller Foundation. Published by The Rockefeller Foundation. 455 Pages.